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By

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PREFACE

Co-operative farming has become a burning topic of the day and some of the leaders of the country consider the pooling of individual fields and labour as a sure remedy for creating farm surpluses which are an essential precursor of economic development. It is claimed that co-operative farming will accelerate capital formation by increasing the rate of internal savings and, thus, pave the way for industrialisation of India. Examples, particularly of Russia and China, are suggestively quoted on the basis of surprisingly superficial observations and merest hearsay. The Planning Commission has given consideration to the matter and made certain recommendations favouring the idea, albeit cautiously. The purpose of this book is to urge dispassionate and renewed thinking on the subject with particular reference to the conditions prevailing in this country.

Zamindari and the like systems have all but disappeared from this country. The peasant is rapidly coming into his own. While the results of this stupendous reform are still in the process of crystallising, word has gone forth from authoritative quarters that the country should switch over from peasant farming to an economy of large co-operative farms established by farmers, pooling their lands and placing them under a common management.

The replacement of farm tenancy by peasant proprietorship effects no change in the soil, nor in the production technique; yet it raises production. That has been the experience all the world over. Statistics can be quoted in support, but it is unnecessary to do so in view of the wide and unquestioning acceptance of the proposition. The reason is that it generates forces which stimulate the free development of the peasant's personality. The thought that land has become his and his children's in perpetuity, lightens and cheers his labours and expands his horizon. The feeling that he is his own master, subject to no outside control, and has free, exclusive and untrammelled use of his land drives him to greater and greater effort. He receives a psychological fillip which vitalises his attachment and devotion to the land. In other words, although the abolition of landlordism does not affect the farm, it powerfully affects the farmer. Likewise, any system of large-scale farming in which his holdings are pooled must affect the farmer, but in the reverse direction. No longer will he be his own master; he will become one of the many; his interest will be subordinated to the

group interest; he will have to submit to the control and direction of the group management. Even if the right to secede at will is preserved in theory, in practice it will nearly always be found that the seceder cannot be given back his land, for such restoration will be detrimental to group interest; he will have to be content with its money equivalent. The forces released by zamindari abolition will suffer a reaction, and one should in consequence expect a fall in production. This is in fact what happens. Inside these pages will be found factual evidence, derived from various sources and pertaining to several countries whence reliable figures are available, that per-acre production falls as the size of farm increases. In the case of a co-operative farm it will be a case of too many cooks. In a word, if zamindari abolition is psychologically right, co-operative farming is psychologically wrong.

The co-operative principle has undoubtedly a very fruitful mission in the field of agriculture, but when stretched to the point of merger of holdings, it violates the essence of true co-operation. Independent businessmen 'co-operate' to remove individual disabilities, but when independence itself is compromised and the farmer is reduced to a farm hand, it is not a case of true co-operation. It is preparing the ground for authoritarian control. A self-elected few will exploit the simplicity, ignorance, credulity and lethargy of the overwhelming majority and dominate the co-operative farms. They will lean on officialdom for support and support it in return. In place of the intermediaries who have been liquidated, a new class of intermediaries will be created with the same hard core, but more powerfully entrenched and masquerading as the spearhead of a new co-operative movement. Local bosses, which the officials of the co-operative will degenerate into, will slowly but surely undermine the very foundation of our nascent democracy and reduce the peasantry, 'their country's pride,' to the status of mere labourers. Sovereignty resides in the people and for that reason the Constitution guarantees fundamental rights to the individual. To the extent that the individual is hampered in the proper appreciation and free exercise of the fundamental rights, to the extent that his personality is cramped, to the extent that his independence of thought and action is subjected to extraneous control, to the extent that his destiny ceases to be his sole concern, the seat of sovereignty will tend to shift from all to the few, and the country will have taken the road to regimentation and totalitarianism.

Large-scale farming, whether co-operative, collective or of any other pattern, inevitably attracts mechanisation. In fact, the popular but erroneous belief that mechanisation increases production is used as an argument for the introduction of co-operative

farming. Whatever may be true of countries with different soils, different climatic and rainfall conditions, and differently placed in the map of the world, in this country with a tropical climate and a thin layer of fertility mechanised tilling will reduce, not enhance, the yield. Mechanised cultivation on large farms may pay their few owners in money; it cannot pay the nation in greater tonnage, while in the circumstances of India every ounce matters.

Our economists and planners, perhaps, do not take into account Indian conditions but are influenced by the theories of Karl Marx who concluded without due examination of facts that the laws regarding industrial development at which he had arrived, applied to agriculture also. In India the amount of arable land is limited and the population dense. The production per acre has, therefore, to be increased. In the USA, Canada, Australia and other such countries, the best results are obtained by large-scale mechanised farming, which increases the production per man, because plenty of land is available and labour is scarce.

The other effects of the displacement of human and animal power by petrol and diesel on the economy of the country may be easily foreseen. Unemployment will be accentuated. In the circumstances of our country, industries and services cannot absorb the number of persons that will immediately be released from agriculture by any large-scale pooling of lands. Co-operative farming as an instrument of national policy has thus a very important human aspect.

Import of machinery and motive power will strain the none too sufficient exchange resources of the country.

It is not generally realised that, with the replacement of the bullock by the tractor, farm-yard manure will become scarce and increasing use will have to be made of chemical fertilizers. Evidence collected in this book will prove that the use of inorganic fertilizers tends to reduce soil fertility, even though the immediate results may be striking. Organic manure, on the other hand, maintains fertility and makes the soil an inexhaustible source of food supply. It is not without good reason that the agricultural experts of this country do not now advise unadulterated use of synthetic sulphates and phosphates. The country should not too hastily embark upon a venture for which posterity may condemn the present leaders.

In short, large-scale farming will reduce production, injure the democratic principles which the country cherishes, invite bureaucratic control and lead to rapid mechanisation with all its consequences. Peasant farming, on the other hand, will enable the

country to steer a path which may not be spectacular but which will ensure that it does not abruptly go off the rails.

Our problems are staggering, indeed. Only if we realised them! We are faced with formidable impediments of lack of capital, miserably low ratio of capital formation to population growth, large-scale unemployment, still larger scale of under-employment, relatively inadequate land and other natural resources, insufficient agricultural production and an impatient population whose aspirations have been awakened and which is becoming increasingly conscious of poverty and economic differences. These problems will require all the energy, skill, administrative acumen and the statesmanship we are capable of.

There is no example which India can follow in solving her problems because in no other country conditions were identical to ours. We can never attain the standards of the USA because our physical resources per capita are comparatively little, or those of the UK because we cannot build up an industrial structure as the UK did on the exploitation of foreign resources and foreign peoples. Nor can we hope to copy the methods of the USSR or China because, as apart from the far more favourable natural resources-man ratio in the former country and the balance-sheet of results in their totality in both, we have given ourselves a democratic constitution.

The belief that our vast population is in itself a great asset and an incentive for large-scale industrialisation, is unfounded. In view of the paucity of physical resources relative to population, our low purchasing power and the hard fact that capital or financial resources can ultimately be constructed out of physical resources, India's huge population is an impediment to economic development or industrialisation—a definite liability, not an asset.

It would not, however, be proper to take merely a negative attitude. An attempt has, therefore, been made in this book to give a positive answer.

It is well established that non-agricultural employments enjoy superiority over agricultural employments as a source of income. That is why every advanced country has been trying ever since the last century to develop its own manufactures and find employment for its nationals in businesses and vocations other than production of raw materials. In the case of our country, however, this trend has been in the reverse direction. Whereas the share of agriculture in the labour force in other countries declined, in this country, for want of sufficient non-agricultural vocations to absorb the year to year growing labour force, it moved up—a phenomenon which should cause alarm to every lover of India. The existing situation, therefore, calls for immediate and earnest mea-

sures for diversification of our economy—for the development of non-agricultural resources. In this respect there are two schools of thought—one is an advocate of capital-intensive large-scale enterprises as exist in advanced Western countries while the other school prefers a pattern of decentralised small-scale industries geared to agriculture.

For establishing large-scale enterprises, capital in the country is admittedly scarce. It is possible neither to obtain the necessary amount of capital from external sources without strings or at the rates of interest we can afford to pay, nor to raise it from internal savings, for capital formation continues to be slow and meagre. Employment potential of capital-intensive enterprises is also small. Disposal of goods produced by capital-intensive industries will present formidable problems, for our own people have a poor consumption capacity and foreign countries have a tendency to restrict imports. Further, a policy of rapid large-scale industrialisation seems to be fraught with economic and political risks. Except for important qualifications, therefore, we need not make haste to set up a capital-intensive structure and, in consequence, have to rely on forced savings which might completely break the people.

Shortage of capital and redundance of labour being the governing factors in determining the pace of economic development, we have to begin with, and rely mostly on, labour-intensive enterprises requiring little or small capital. Small units spread all over the countryside and carried on in cottages and small workshops, covering all branches of human needs, will produce almost all the consumer goods needed by the nation. By virtue of their extensive employment potential they will help in ensuring equitable distribution of wealth and fostering a democratic way of life. Such a structure is likely to increase the rate of financial savings and, in consequence, will result in capital formation because the time-lag between the input of labour and the flow of output would be almost negligible.

Progressive increase in the rate of capital formation and in the purchasing capacity of the masses will release a chain of economic reactions: markets will expand and, with the passage of time, a more favourable technological climate will develop. These, in turn, will provide the needed impetus for the growth of light, medium and thereafter large-scale industries. It is this sequence which would seem to suit our conditions best.

We cannot shun advances in technology. Technology, in fact, is now not confined to big industrial units alone; small and light units can also be developed with latest methods.

If per capita income or output has to be raised, the rate of capital investments will have to be increased—and increased at a rate higher than the rate of population growth. This means that the rate of financial savings will have to be far greater than today. If capital formation cannot keep pace with population, there will be a retrogression of economic standards—retrogression of even the miserable standards that we enjoy today. Prudence dictates, therefore, that in addition to taking other steps, we divert by voluntary persuasion, of course, the energies of the idle and the semi-idle labour in the villages to capital-constructing schemes on *shramdan* (free labour) basis, if possible, or on nominal wages, if necessary. Either of the alternatives, *viz.*, continued unemployment which the present situation means, or inflation which payment of full wages implies, will result in deferment of economic development and consequent prolongation of misery. To the extent, therefore, that unemployed man-power can be so mobilized, will democracy be ensured and strengthened in India and other densely-populated but under-developed countries.

A surplus food supply is the *sine qua non* to industrialisation. We have till now been looking at it all from a wrong angle. Industrialisation, of course, to the extent it is possible in our circumstances, cannot precede but will only follow—at the most it can only accompany—increased agricultural production. Our per acre yield, however, is miserably low, much lower than in most of the countries of the world. Despite 70 per cent of the entire population being engaged on land, food production remains short of requirements, necessitating import of millions of tons of foodgrains year after year even after the advent of Independence. Obviously, no country, much less a poor country like India, can afford to go on feeding her people indefinitely in this manner. It is even doubtful if foodgrains in such large quantities would be available in the world market after some years.

More capital investment, improved farming practices and harder work on the part of the peasantry can undoubtedly make our fields yield several times more than at present, resulting in farm surpluses. Land being limited, the only practical solution of the problem lies in the intensive utilization of our land resources. And it is small-scale farming on individual basis, aided by a net-work of service co-operatives, that will utilize our land resources at their maximum, that will increase production per acre—increase it to the extent of being so greatly surplus to the needs of the farmers, that, because of diminishing incentives in farming, people are automatically released for absorption in industries and services. Large-

scale joint farming, on the other hand, will merely release workers without producing enough of food to keep them alive and working.

As pointed out in Chapter XX, to put it in a nut-shell: inasmuch as industrialisation will progress to the extent men are released from agriculture, and men will be released to the extent agricultural production goes up, and agricultural production will go up to the extent agricultural practices improve and more capital invested, industrialisation or economic development of the country turns on improvement in agricultural practices we are able to effect and amount of capital we are able to invest in land. We must bear in mind, however, that in spite of our best efforts, inasmuch as our land resources relative to population are meagre and as, in a given area, more men produce a greater total of food than fewer men, we will, like Japan, and unlike the USA and other countries which have comparatively larger land resources, have always to keep a very large percentage of our people occupied in agriculture.

Promotion of innovations or technological improvements is as necessary as accumulation of capital. Only three centuries ago India stood, at least, on the same economic level as Western Europe. Today, things have considerably changed. The reason lies in the greater propensity of the Westerners to innovate. To that end impediments like illiteracy, ill-health, caste-system and a fatalistic attitude of life that most of our countrymen suffer from, will have to be removed. Then alone will the efficiency both of labour and available capital improve.

Stress will have to be laid mainly on bringing about technological improvements, for example, in indigenous ploughs, in the use of organic manures, in constructing small irrigation works, and in the organisation of handicrafts and small industries, rather than doing things in a big way or reproducing expensive European and American models—big farms, big factories, big irrigation or hydro-electric projects. Apart from other considerations, big economic projects take time to fructify. Capital is locked up for years together; meanwhile, with passage of time and increase in population, problems multiply and become more and more intractable.

But there is a limit to all this. The country cannot go on allowing the population to increase indefinitely and, by improving the farming practices, produce more and more food and, by relying on a mixture, howsoever judicious, of labour-intensive decentralised enterprises with capital-intensive forms, go on staving off poverty and misery for ever. There is a limit to substitution of land by labour, capital or improvements and, in consequence, not only a limit to agriculture production but also to development of services and industries, which means that there is a limit to population the

country can support. A deceleration of the rate of population growth, thus, becomes imperative. Various methods of doing this have, therefore, also been briefly discussed in the concluding chapter.

This in brief is the theme of the book. The survival of the country and its freedom—the democratic way of life—are at stake. If the book succeeds in making farmers, industrialists, public workers, etc. to think for themselves in the light of material provided herein and come to their own conclusions rather than be led away by mere imitative slogans borrowed from other countries or by the fact that some of the biggest leaders of the country have adopted a particular line of thinking and are very insistent on it, it will have served its purpose.

It is in a spirit of great humility that I approach my countrymen with this book. I lay no claim to any originality. In fact, I do not consider myself mentally equipped to write at all on such controversial subjects, particularly, industrial development. But, in course of my duties as a public worker, I felt the need of an integrated picture of our economic problems and their solutions. Others also have felt a similar need. Shri T. T. Krishnamachari, then Finance Minister of the Union Government, in a speech in the Lok Sabha in April 1956, is reported to have said: "It is, however, true that we have not yet evolved an economic philosophy of our own, and such as exists is necessarily ambivalent. We have, perhaps, no clear idea of the entire picture of the economic future that we desire this country to have. We are apt to think in compartments without any attempt at synthesizing the conflicts that thinking in compartments necessarily engenders."* An attempt at supplying the desideratum has been made in these pages. Otherwise, almost everything that has been said here has already been expressed somewhere else and, perhaps, in a better manner. I have drawn greatly, both in ideas and words, from David Mitrany's *Marx Against the Peasant* (George Weidenfield and Nicolson Ltd., London, 1952), Horace Belshaw's *Population Growth and Levels of Consumption* (George Allen and Unwin Ltd., London, 1956), Elmer Pendell's *Population on the Loose* (New York, 1951) and Kingsley Davis's *Population of India and Pakistan* (Princeton University Press, New York, 1951). To the authors of these works I owe a deep debt of gratitude.

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* Introduction to *A Philosophy of Indian Economic Development* by Richard B. Gregg, published by the Navjivan Publishing House, Ahmedabad, 1958.

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LUCKNOW :
June 16, 1959 CHARAN SINGH

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Part I

CHAPTER I

INTRODUCTORY

Living creates wants, which can be satisfied only by use and consumption of goods, collectively called wealth. By and large, wealth is ultimately derived from land. Raw materials must be produced before they can be processed and distributed, and food which, day by day, is necessary to life is mostly obtained from land. Exploitation of land, or agriculture in the narrower sense, is thus obviously the primary and basic industry. Manufacture and commerce, however important they may be in the economy of a country, must of necessity occupy a secondary place.

While land suffers from the limitation that it cannot be increased by any efforts that man may make, it has the supreme advantage of becoming better and better by proper use. All other forms of capital —houses, factories, locomotives, battleships, etc.,—deteriorate or disintegrate and are ultimately destroyed, howsoever carefully they may be used; but land seldom. It is this inexhaustibility of land that gives those directly engaged in working it, a feeling of security, which no other means of occupation can offer. Land never disillusions a man completely; the hope of plenty in the future always remains, and is not infrequently realised.

Obviously enough, the prosperity of a country depends in the ultimate analysis on how efficiently it utilises and, at the same time, conserves this free gift of nature. Even the form of society or civilisation that a country hopes to develop will be influenced by the manner in which it exploits the land, and by its land-tenure. "Measures of land reform", observes the Planning Commission,* "have a place of special significance, both because they provide the social, economic and institutional framework for agricultural development and because of the influence they exert on the life of the majority of the population. Indeed, their impact extends much beyond rural economy." This is specially true of countries like China, Turkey, Rumania, Yugoslavia, India and the USSR where large percentages of population ranging from 57 to 73 earn their living by working directly on the soil.

India inherited from the British a feudal or landlord-tenant system called zamindari, under which ownership of land was concentrated in the hands of a few, while the vast majority who worked

* Second Five-Year Plan of India, p. 177.

day and night on the land were mere tenants. The growth and development of democratic institutions are closely related to the national income of a country and its distribution. In an underdeveloped country like India, income directly derived from land is the chief source of wealth, and ownership of land has since long been accepted as the prevailing standard of status. Land reform, therefore, was the one economic organisational change which was needed before an overall programme of social reconstruction could be contemplated, a more productive economy could be built up, and, in fact, before we could dream of making democracy a success.

With few exceptions landlords performed no economic function; the lands which were tilled by the tenants would not produce less if the landlords disappeared. They rendered no service in return for the rent they received, and were, in the truest sense of the term, parasites, or 'drones doing no good in the public hive.'

That man alone, who is not subservient to another in the economic sphere, is truly happy. Under the zamindari system, however, the tenant was not free; somebody else was the owner of the patch of land on which he toiled along with members of his family. In most parts of the country there was no property he could cherish; and in many cases he was liable to eviction at the sweet will of the zamindar. Nor could he claim social equality with the latter, for status in the village was determined by rights in land.

Agricultural data from all over the world show that farm tenancy reduces output. The abolition of landlordism was not, therefore, just a matter of social justice to peasants. If agricultural production was to be increased, and the peasant's energetic participation in the country's economy was to be secured, he was to be given that much hold on the land which met his deepest desire. He was to be made the owner of the land he tilled.

The landlord-tenant system created classes and, therefore, led to class war. While the tenant pined for safeguards against capricious eviction, real security of tenure was odious to the zamindar. The State tried to strike a balance. Yet the conflict inherent in the system was never resolved. It led to economic and political unrest. The big zamindars mostly stood for political reaction; they were the props of British rule and dreaded a democratic set-up.

For these and other reasons, leaders of the country decided years ago that, if the decks were to be cleared for social and economic reform and for political stability, the feudal, landlord-tenant system had to go.

CHAPTER II

TYPES OF AGRARIAN ORGANIZATION

The landlord-tenant system has departed from almost all the States and consolidation of holdings is going apace in some. But neither the change in ownership and legal relations, nor consolidation of holdings with all its benefits, can have much effect on either the size of the farm or the type of farming. So the question of the future agrarian organisation as an economic, technical and also as a social problem, has yet to be stated and answered. Is land consolidation the last step or is it merely an intermediate stage—a prelude to something else? There is confusion in the public mind on this crucial issue.

There are three alternatives before us, *viz.*

(i) Land can continue to be operated in small units, not by tenants in bondage as hitherto, but by an independent peasantry with or without the assistance of some hired labour;

(ii) We can have large private farms worked with hired labour;

or

(iii) We can have large joint farms constituted by peasant farmers pooling their holdings voluntarily or under compulsion, and worked with joint or collective labour.

Small-scale peasant farming and large-scale private farming need no explaining. Nor is joint farming today an altogether novel device. It has been used for a number of years in several countries, notably in Soviet Russia, Mexico and Israel. The Soviet type, although somewhat different in form in the beginning, has just been ushered in China. It will be useful to make a rapid review of the working of the system in these countries.

CHAPTER III

FEATURES OF MODERN JOINT FARMING[1]

In Soviet Russia, as a consequence of the Bolshevist Revolution of 1917 carried out under the slogan of 'Peace and Bread', all land was distributed among the peasants. The result was a splitting-up of all the land into some 25,000,000 small farms, each of them capable of producing barely more than was needed by the peasant's own family. Little, if anything, was left to supply the cities. To run his farm, the small peasant needed credits, and obtained them from the wealthier farmer, the *kulak*. Both, the deficiency of marketable output and the dominance of the middle class *kulak* presented to the new Soviet State grave problems, which had to be solved in terms of its Marxist ideology.

Following the industrial pattern, the Communists argued that farming had to be mechanized. If the peasants could be induced to pool their land and use agricultural machinery in common, not only would the dominance of the *kulaks* be broken but marketable surplus would also be better mobilised. In addition, large-scale joint farming by mechanical means would reduce the number of hands needed in agriculture, and thus free them for use in industry, the expansion of which was, in turn, the *sine qua non* of the mechanisation of agriculture.

A *Kolhoz* or *Kolkhoz*—collective farm—is formed when several peasants living in the same neighbourhood decide, or are induced to make the decision, to socialise their 'basic means of production', *i.e.* labour, soil, draught animals, farm structures and implements, while keeping their individual homes, a small garden, a few livestock, poultry and the like, for themselves. Membership is open to all toilers, who have reached the age of sixteen, and who are willing to comply with the established rules and regulations. Application for membership to an already established *kolkhoz* is taken up, first, by its Management Committee and is, legally, subject to the approval of the General Assembly. If accepted, the member pays an admission fee which varies in accordance with his previous status. Excluded from membership are *kulaks* and the people deprived of their civic rights. Exceptions are made in the case of families who count among their members a soldier, sailor, or village teacher who

[1] Account of joint farming in Russia, Mexico and Israel has been mostly lifted from Henrik F. Infield's article published in the *Year Book of Agricultural Co-operation*, 1951.

is ready to recommend the applicant. Interesting enough, and a sidelight on the effect of collectivisation when ordered from above, is the provision barring peasants "who, before joining the collective farm, slaughter or sell their cattle, get rid of their stock, or wantonly sell their seed corn".

The collective *Ejido* of Mexico can be considered as a sub-type of the *kolkhoz*. *Ejidos* are the new land settlements which were first formed under the agrarian reforms of 1915. They are the offspring of discontent among labourers in a country of large-scale capitalist farming. There must be at least twenty eligible males to form a group which petitions the Government for land. They must own not more than 2,500 pesos, or be of low income status. If the group can lay claim to land that once belonged to them, the land is 'restored' to them; if their only claim is landlessness, land expropriated from wealthy land-owners—*hacendados*—is 'donated' to them. Both processes are quite protracted and cumbersome, and open to many profiteering practices on the part of the administrative personnel. The allotted land is given to the group in common possession. The members are free to decide whether they want to divide it up and work it individually, or whether they prefer to run it collectively. No admission fee is charged, but each member of group applying for land must contribute his share to the expenses incurred in the process of land assignment.

While the *kolkhoz* and the *ejido* owe their establishment to administrative measures, the *Kvutza* grew out of the spontaneous decisions of those who first shaped its essential socio-economic structure. A particularly acute situation arose in connection with the requirements of Zionist resettlement in Palestine. The development of Jewish agriculture faced two main obstacles: (1) the extremely poor quality of available soil; and (ii) the almost complete lack of agricultural experience on the part of the prospective settlers. Progress along the lines of traditional individual settlement proved to be so slow as to make prospects for success in the near future very doubtful. The only alternative which offered itself under these circumstances was that of group-settlement. There was, in fact, hardly a choice in the matter. The question appeared to be rather one of either group settlement, or no settlement at all. The type of settlement which emerged has since become widely known under the name, *Kvutza* or *Kibbutz*.

It was a small group of people devoted to the task of building a Jewish home in the land of their dreams who, after freeing themselves from the uncongenial supervision of a professional agronomist, step by step, experimentally testing their way ahead, developed out of their own free decision what is today called *kvutza* or

kibbutz. Once this small group of pioneers had set the pattern, and others in relatively large numbers had begun to emulate it, the formation of a *kvutza* became formalised. Today there are two possible ways in which one can join such a settlement, or a group, which prepares for settlement. To be eligible in both cases, one must be a Zionist over eighteen years of age, in good health, and of good character. In the first case, one serves as a candidate for a period of six months to a year, during which time he enjoys virtually all rights of membership with the exception of a vote. At the end of this period, the case of the candidate is brought before the General Assembly, which decides about his or her admission. No admission or any other fee is paid; but the new member is expected to put all his possessions into the pool. In the second case, the applicant takes part in a training which begins often prior to emigration to Palestine, in one of the Pioneer Training Farms. This training is so devised as to develop the aspirant's capacity for working and living together with others aiming at the same goal. Groups thus prepared form a 'nucleus' (grain), which stays together after immigration to Israel. They continue for a shorter or longer period their preparation, while handling all affairs communally, until the time when they are assigned land for settlement. The period from the start of preparation to final settlement used to last formerly sometimes as long as five years. The establishment of the State of Israel made larger areas available for agricultural settlement, and the waiting period has been shortened considerably.

The *kolkhoz*, the *ejido*, and the *kvutza* are alike in their theoretical adherence to the principles of co-operation. The internal administration of all three is based on the Rochdale Principles. It is only that, true to their nature as communities, all three had to modify some of these principles to make them fit their specific requirements. One of these principles is that of open membership. Community implies more than limited economic activity; it means living as well as working together. Moreover, community is also naturally restricted by the extent of the geographic area in which it is located. Because of these and other reasons, membership in a community cannot be open in the same sense as it is, for instance, in a consumers' store. For this reason the admission of members has to be subject to requirements stricter than those imposed in co-operatives of more limited aims.

Another principle which had to be modified when applied to the concrete community situation is that of distribution of dividends according to the amount of purchase. Since the most important aspect of participation in these joint enterprises is that of shared labour, distribution of net profits according to the amount of pur-

chase would make little sense. The practice followed in all three instances is, rather to take the amount of labour contributed as the main basis for the equitable distribution of profit.

As to the remaining principles, the practice in all three instances is identical with that in any other genuinely co-operative association. No member has more than one vote; only nominal interest, if any, is to be paid on investment; all members have equal rights, there being no distinction on account of sex; there are regular meetings at which the members participate in decisions; and, finally, members observe rules of proper auditing.

In all three, it is the General Assembly of all members which is designed as the highest authority in all the internal affairs of the group. The practice of delegating the conduct and supervision of the community's business to elected committees is common. Admission, punishment and expulsion of members vests, by law, in the hands of the General Assembly.

Although theoretically autonomous, the *kolkhoz* and the *ejido* are much more dependent on government-controlled agencies than the *kvutza*. The *kolkhoz* is part of a planned economy. It depends, therefore, on decisions made by the state authorities, particularly, the *Gosplan* (The National Planning Commission). What is more important: it is under the direct control of the so-called Machine and Tractor Station which started as a machine-lending centre and has since become the 'heart and centre of the local agricultural administration'. Today, the MTS provides the *kolkhoz* not only with all large-scale machinery and the staff, but also trains the members in the required skills, and advises them on rotation of crops, the proper use of fertilisers, soil conservation, and other related problems. Above all, the MTS enforces the delivery of that part of the farm produce which the state claims as its share.

A similar, though less stringent supervision is exercised by the state in the case of the collective *ejido*. Here there are two main supervising agencies: (i) The National Agrarian Commission which, through State Commissions, directs the establishment of the settlements; and (ii) The National Bank of Ejido Credit which, in addition to furnishing the funds necessary for the running of the settlements, exerts supervisory functions similar to those of the MTS. The Ejido Bank has been described as a combination of banker, agricultural expert, family doctor, school teacher, lawyer, athletic director, and personal adviser of the *ejido*.

It is true that the *kvutza*, too, has received both land and credits from the Jewish National Fund and the Foundation Fund respectively. From the moment of its formation, however, it has always been essentially on its own. In all its relations with the ad-

ministrative agencies the role of the *kvutza* has been that of a 'contract-partner' rather than that of a 'controlled dependent.'

More marked than any other is the difference in the extent to which co-operation determines the internal activities of the three farm types. Only large-scale agricultural production is carried on jointly in the *kolkhoz* and the *ejido*. In both, work is done by the members themselves; outside labour may be hired only in times of emergency. In the *kolkhoz* the members form 'work-brigades' composed of five to fifty members, depending on the specific assignment which is made by the Executive Board. Each brigade is directed by a foreman. In the *ejido*, work is organized less strictly, but each member must obey the orders of the elected work-chief. An indicative provision of the Model Rules, which regulate work relations, is the one that forbids the members to accept any outside work as long as the *ejido* itself is in need of their labour.

Co-operation thus limited requires a rather complicated and cumbersome method of accounting. There are two sources of income for the members of the *kolkhoz* and the *ejido*. One is derived from the individual sector production which still exists but is gradually dwindling away: an acre or less of land, a cow, some pigs, and so on, in the *kolkhoz;* and some small animals, like poultry and pigs, in the *ejido*. The main source of income, however, is large-scale, jointly-run agriculture. In both the *kolkhoz* and the *ejido*, the member's share in the harvests is based on the number of labour-days contributed during the year. In the *kolkhoz* this share is calculated after deduction for taxes, reserves, construction and repairs, on the basis of a measure called 'Work-day' (*trudoden*). This measure is both quantitative and qualitative; an unskilled labourer will require more hours than a skilled one to fill his *trudoden*. In the *ejido* there are three kinds of compensation for work: (i) wages, which differ according to skill; (ii) piece-rates, paid during the cotton-picking season; and (3) equal shares in the common profit. Work on community projects, school buildings, meeting-halls, roads, is done without any compensation.

The more restrictive aspect of the work relations in *kolkhoz* and *ejido* is reflected in the measures needed to enforce discipline. Punishment is provided in the *kolkhoz* for violations like failure to carry out assignments or to fulfil social obligations; for absence from work without adequate excuse; and for negligence in handling equipment and livestock. The punishment may range from reprimand or warning to temporary suspension and fine, or even to expulsion. In the *ejido* the utmost penalty is imposed for (i) continued lack of willingness to work under the direction of the elected authorities;

(ii) creating disorders; (iii) agitation against the collective system; and (iv) robbery and other criminal offences.

Compared with all this, the system of the *kvutza* is simplicity itself. The *kvutza* has no use for work-cards, advance wages, shares in profit; nor does it need any measures of punishment. In the *kvutza*, production, consumption, as well as all social activities are co-operative, and everybody is trusted to work according to his best abilities, and to claim from the commonly available goods a share according to his own needs. If a member works on the outside, his earnings go into the group's common purse. No penalty has to be stipulated for absence from work or, for that matter, for any other offence. This does not mean that violations do not occur. They are dealt with in a spirit of 'family' persuasion and admonition. Expulsions are extremely rare.

The organization of *kvutza* or *kibbutz* is probably the most complete form of communism in the non-political sense of the word, that the world has known outside monastic communities. Land is not owned, but leased, usually from the Jewish National Fund. Members, who may be men or women, bring in little or no capital of their own; initial resources are provided by loans from various Zionist funds, and the 'own capital' of the *kibbutz* is accumulated gradually out of annual surpluses. In its dealings with the outside world, the *kibbutz* is on a money economy, and its accounts are kept in that form. Internally, no money passes. Members eat in the common dining-room and receive from the common store clothing, which is washed and mended at a common laundry. From the common store they draw also personal needs and comforts such as soap and cigarettes. As the settlement becomes established, cottages or small blocks of flats are built, in which each worker or married couple is allotted a room. The furniture of these rooms, books, pictures, wireless sets or musical instruments are their only personal possessions. These may be allocated from the property of the *kibbutz*, given by friends or purchased from the allowance, usually about £20, which each member receives for an annual holiday. There are no wages and no individual allocation of surplus at the end of the year. If there is surplus it is used to improve communal services or amenities. A member who leaves has no right to any share in the common property of the *kibbutz*.

Except in a few *kvutzot*, children do not live with their parents, but are placed from early infancy in nurseries, whence they pass to kindergartens and schools, always living with the children of their own age-group until they are old enough to become working members of the settlement. All settlements provide elementary schools. Education up to fourteen is compulsory in Israel. Some also

have secondary schools, or a secondary school is run by a group of neighbouring *kibbutzim*. The decision to release a young worker for university education, and to pay for his or her expenses, is taken by the *kibbutz* as a whole, and is influenced by the *kibbutz'* need for a specialist in any particular field of study. The *kibbutz* takes full responsibility for the medical needs of its members and also for the care of the aged.[1]

The *kibbutz*, although probably the most discussed, is by no means the only form of co-operative agriculture in Israel. It was apparent at an early stage that there were prospective settlers who were prepared to accept the ownership of land by a national fund, the avoidance of hired labour and a high degree of mutual aid, but not "the extension of collective discipline in the *kibbutz* to cover all aspects of social and economic life. They sought greater scope for personal initiative and individual variety. They felt, too, that the fundamental importance of the family as the organic unit of society, had been neglected by the *kibbutzim*."[2]

In settlements of this type known as *Moshav*, the land which is leased collectively on a forty-nine year lease, is divided into small holdings, which may be from four to forty acres, according to the type of agriculture carried on. Not infrequently the earliest settlers received two plots, in anticipation that the second plot would be prepared for handing over to a member of the next generation. Some settlers continued to be part-time workers on private farms while they built up their holdings. Though a general cropping plan is adopted by the settlement, members are free to carry on the work of their own holdings as they think fit. Mixed farming is general, including dairy cattle, poultry, vegetables, green fodder, sometimes grown in a communal field, fruit and grain, usually with the emphasis on the production of member's own food. Settlers have their own houses, and family life follows the usual pattern. In addition to farmers the settlement includes workers providing village services —drivers, mechanics, cobblers, shopmen, besides teachers and doctors, amounting to some 20 per cent of the community.

Co-operative organisation is, however, comprehensive and compulsory. In some *moshavim*, a single co-operative looks after all the common interests of the village, social, administrative and economic. In others, there are two organisations, one, virtually a local authority, concerned with land leasing, roads, schools, health services and buildings; the other, a co-operative in the ordinary sense, engaged in the marketing of produce, the supply of domestic and

[1] The degree to which an ageing population will alter the economy of the *kibbutzim* has hardly yet been considered.

[2] *Co-operative Farming in Israel*, Itzhak Korn.

agricultural requirements, and agricultural services such as stock-breeding, mechanical cultivation and water supply. In some cases the consumers' co-operative is a separate society. Credit is usually made available, sometimes as specific loans, sometimes by the simple process of allowing debts to accumulate till crops are sold.

A variant of the *moshav* is the *Moshav Shitufi*, which may be described as half-way between the *moshav* and the *kibbutz*, in that farming (with the exception of small flower and fruit gardens) is carried on collectively while the members continue to live their family lives in private. Unlike the members of *kibbutzim*, they are paid, but in proportion to the needs of their families, not (as in Russia) to work done, and at least in some *moshavim shitufim* payment is made, to a considerable extent, not in national currency, but in chits which can be cashed only in the co-operative store of the community.

The last few years have seen a rapid increase in the number of *moshavim*, which by 1950 were nearly equal to the *kibbutzim* in number and population. The number of *moshavim* from 1948 to July, 1955, went up seven times, *viz.* from 34 to 236, while that of *kibbutzim* during the same period only doubled, *viz.* from 138 to 279.

As regards joint farming in China: the Central Committee of the Communist Party of China distinguishes four types of organisation for agricultural production: (i) the temporary (seasonal) mutual-aid team—a simple form of collective labour. Under this arrangement any group of families, with or without land, may come together and form a labour exchange. The farmers are left in possession of their own fields. "Surplus draught animals and implements are loaned to the team by those members who do not need them for current use. Points are allotted to each member for the work done by draught animals, tools or human labour. The credit would be different for manual labour, use of implements or draught animals and also for quantity and quality of work;"[1] (ii) the permanent mutual-aid team—a certain division of labour and assignment of specific work on the basis of collective labour and a small amount of communally-owned property; (iii) the 'elementary' agricultural producers' co-operative—in which members *pool* their land as shares and there is unified management and a greater amount of communally-owned property; and (iv) the 'advanced' agricultural producers' co-operative based entirely on collective ownership of the means of production.

[1] Page 34 of the Report of Indian Delegation to China on Agrarian Co-operatives, 1956, hereafter described as the Patil Delegation after the name of its leader, Shri R. K. Patil.

The mutual-aid teams are relatively informal organisations. "In the elementary co-operative, 'the principal means of production such as land, draught animals and farm tools owned privately by members are put under a single, centralised management and gradually turned into their common property', and 'the co-operative pays each member an appropriate sum as dividend out of its annual income, commensurate with the amount and quality of land the member pools in the co-operative'. The 'advanced' type of co-operative is 'a socialist collective economic organisation' to which 'peasants joining the co-operative must turn over their privately owned land and other important means of production, such as draught animals, large farm tools, etc., to the collective ownership of the co-operative'."[1]

"In China, a distinction is made between the feudal elements in agriculture and the capitalist elements. The non-cultivating land-owner is considered to be a feudal element and his lands have been confiscated without any compensation. The land-owner who cultivates himself is considered to be a capitalist element. While the Chinese authorities are pursuing a vigorous policy of substituting peasant proprietorship, which in their view is essentially capitalist agriculture, by co-operative farms, which is socialist agriculture, they have not confiscated the lands of any land-owner who cultivates them himself unless he has been accused of crime against the State and the regime".[2]

Those who are not eligible for admission into a co-operative include, "according to model regulations, former landlords, rich peasants and counter-revolutionaries whose status has not been changed and who have not yet qualified for membership under the warrant of the local people's council, and persons deprived of political rights. Poor peasants and middle peasants are specially encouraged to join co-operatives and active steps are taken also to draw in demobilised soldiers, dependants of revolutionary martyrs, soldiers and government workers and also new settlers".[3]

It is clear, however, that the Chinese agrarian policy is set towards an ultimate collectivisation of agriculture on the Russian model; the first three types are merely intermediate stages. 'Their ultimate objective is to pass on from peasant farming, first, to co-operative farming and, then, to collective farming at the earliest opportune moment".[4] They have not tarried at the intermediate

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[1] Page 110 of the Report of the Indian Delegation to China on Agricultural Planning and Techniques, July-August, 1956, hereafter described as the Krishnappa Delegation after the name of its leader, Shri M. V. Krishnappa.

[2] Report of the Krishnappa Delegation. p. 61.

[3] *Ibid.* p. 112.

[4] *Ibid.* p. 61.

stages even for five years. No sooner do the agricultural producers' co-operatives come into existence than they are converted into the 'advanced' or collective type. In July, 1955, Chairman Mao Tse Tung had made an important pronouncement when, following a tour of agricultural districts in Central China, he laid down the plans and the party line on agrarian policy and gave the "go-ahead" signal. In only a hundred days, in the autumn of 1955, according to an article under the name of Chau Hansing circulated by the Chinese Embassy in New Delhi, 5,90,000 new agricultural producers' co-operatives were organised in China. This brought their total number to almost 1¼ million. It represented the highest tide, thus far, of a constantly accelerating movement that started in 1951. Then the country had only 300 co-operative farms. At the end of 1953, the figure had risen to 14,000. By the summer of 1955, just before the autumn upsurge, there were 6,50,000 with nearly 17 million peasant households as members.

It is said that by January, 1956, 60 per cent and by March, 90 per cent of the peasant families had joined some sort of a co-operative, of whom 56 per cent were members of the so-called 'advanced' co-operatives or collective farms. By the end of May, according to the Report of the Krishnappa Delegation, co-operatives which numbered a million included 91.2 per cent of the 110 million peasant households, of which 61.9 per cent became members of the 'advanced' type. Collectives or societies of the 'advanced' type in 1955 had numbered only 529. It was felt, initially, that it would take a period of three Five-Years Plans for bringing all households into co-operatives. But "such has been the speed with which co-operation has gone forward that, in most parts of China, the main task of establishing agricultural co-operatives of the advanced type is expected to be completed by the close of the winter of 1956".[1] At the time when the Patil Delegation left China, *viz.* at the end of September, 1956, a figure of 96 per cent was mentioned. According to later reports, it now stands at 97.4 per cent.

According to the *Economist:*[2]

> Social changes have been most revolutionary in the countryside, and one is left wondering how Mao Tse-Tung has succeeded in advancing without bloodshed where Stalin's path was strewn with corpses. Were tax relief and other incentives for the co-operatives and heavy taxation for private farmers enough to push 500 million Chinese peasants into the system? Out of the 110 million families now within the system, less than one-third are still in looser units, where a rent is still paid to them; the remainder are grouped in collective farms which approach the Soviet model.

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[1] Report of the Krishnappa Delegation, p. 110.
[2] Quoted in the *Pioneer*, Lucknow, dated October 27, 1956.

> True, a good deal remains to be done to bridge the gap. There are a million collective farms in China against some 90,000 *kolhozy* in the Soviet Union and the difference cannot be explained merely by the size of the rural population and the character of Chinese farming. Quite a lot of consolidation and amalgamation still lies ahead. The Chinese, however, are in no hurry in this respect; a decade will elapse before they even get the tools necessary for mechanisation. In the next five years the planned 35 per cent increase in agricultural production will have to come from a more rational use of existing resources, from local irrigation schemes and fuller utilisation of natural fertilisers. Only afterwards are vast plans of irrigation and land reclamation to pave the way for the tractor.

China does not possess the resources to produce agricultural machinery in bulk; capital investment is going mainly into heavy industry, and there is little to spare for the import of agricultural machinery or the setting up of large numbers of state farms and machine-tractor stations. In 1953, only 104 (or 2 per cent) of the 4,926 agricultural producers' co-operatives in North-East China were practising mechanised farming. Of all state farms which numbered 3,000 in 1956, only 140 were mechanised. Again, as in Russia, the administration is faced with the problem of decrease in draught animals. In some districts half the buffaloes and oxen are said to have disappeared. Owing to the poor price paid by the co-operatives, peasants have been selling their beasts, particularly those too young to be worked, to the butchers. The State is almost overwhelmed with the number of hides offered to it for sale.

As usual the country cadres are blamed for mismanagement and ignorant 'Commandism.' But the *People's Daily* puts its finger on one basic spot—"the peasant thinks only of getting as much as possible out of the co-operative and whether its interest increases or decreases is not his business."

Another evil, exposed by a long joint directive of the State Council and Central Executive Committee issued on April 3, 1956, is the reckless waste of money by managers of co-operatives. "They merge villages together by building unnecessary houses, squander money on recreational facilities, sports grounds, roads and nurseries with toys for children, and make no attempt to economise to meet productive expenses".[1] *

[1] 'Cattle Shortage in China', *Hindustan Times*, New Delhi, dated May 15, 1956.

* For *latest developments in the Chinese economy*, see Chapter X. The co-operatives have been merged into communes, but the preceding narrative is being retained to serve as historical retrospect.

CHAPTER IV

CO-OPERATIVE AND COLLECTIVE FARMING

The so-called co-operative farm—a farm on the lines of the Chinese agricultural producers' co-operative—about which we hear so much and which so many eminent people in our country seem to regard as the panacea for most of the ills from which our rural body-politic suffers, is advocated as a type of farming which, while not affecting any of our fundamental social institutions or interfering with the framework of private property, will have all the advantages which the USSR is said to have reaped from the *kolkhoz*. The co-operative farm is regarded as representing a golden mean between the capitalist organisation with its stress on individual rights and the complete collectivist system under which all individual rights of property are suppressed and merged in collective or state ownership.

Co-operative farms should be organised, says the Committee on Problems of Reorganisation appointed by the Planning Commission's Panel on Land Reforms, as a first step, on the surplus land obtained on the imposition of a ceiling, Government waste land, considered suitable for cultivation, land reclaimed through public effort and land periodically let out by Government wherever such lands are available in sizeable areas. As a rule, these lands should be settled with co-operatives, and individual rights should not be created in them. They will constitute the nucleus for co-operative farming. The displaced tenants, the landless agricultural workers who may be selected for settlement on these lands, and the cultivators below the floor limit who agree to put their lands into the pool will be admitted as members of the co-operative farm. The farms below the floor limit, which stay out of a co-operative farm at the commencement, should be located contiguously to the pooled area as part of the operations of consolidation of holdings to enable them to join the co-operative farm at a later date.

The aim is to enlarge the co-operative sector until the entire farm land in the village is comprised in co-operative farming societies, in fact, until the entire area of the village, both cultivated and uncultivated, becomes the co-operative responsibility of the community and is managed 'as if it were a single farm'[1].

As regards the method of pooling of land, the following different forms were considered by the Committee:

(i) the ownership of land may be retained by individuals but the

[1] Second Five-Year Plan, p. 197.

land may be managed as one unit, the owners being compensated through some form of ownership dividend;

(ii) the land may be leased to the co-operative society for a period, the owners being paid agreed rents or rents prescribed by law;

or

(iii) ownership may be transferred to the co-operative society, but shares representing the value of land may be given to individuals.

As the surplus and other governmental lands will be settled with co-operative groups and not with individuals, no difficulty regarding pooling of land would arise in their case. With regard to land pooled by individuals, no particular method is recommended and no rigid conditions prescribed.

The following different methods of co-operative management were discussed:

(i) The entire area may be distributed into family units, each unit being allotted to a member family or a small group of families (depending upon the extent of land available with the co-operative) for purposes of cultivation, the member family or the group paying rent to the society. Each family or a group of families will, thus, have a separate plot to cultivate. They will, however, co-operate in the non-farm operations such as provision of credit facilities, supplies, marketing, etc., and in such farm operations as may be feasible;

(ii) The whole farm may be managed as one unit for carrying out principal operations such as ploughing, sowing and harvesting. For subsidiary operations like irrigation, weeding, hoeing, etc., the farm may be divided into small units, each being allotted to individual families from year to year, the families getting a share of the produce as remuneration for work on subsidiary operations;

and

(iii) The whole farm may be managed as one unit for all agricultural operations which will, thus, be centrally controlled by the society, the members being paid wages either on daily wage or on piece-work basis.

The adoption of any particular mode of management, says the Committee, will depend on the technique of farming that may be applied and the degree of co-operation which has developed among the members. Each co-operative farm will adopt the mode of management which suits it best according to its own circumstances. It is suggested, therefore, that at this stage all the various methods may be tried, till suitable techniques of co-operative management are fully established by experience.

The description of the working of joint large-scale farming in various countries and the ideas of the Planning Commission on the subject throw into relief three minor differences between an agrarian producers' co-operative or a co-operative farm and a collective farm of the *kolhoz* type. These are:

(i) A co-operative farm is an entirely voluntary organisation, no one having a right to be admitted to membership as a matter of course. Whereas in a collective farm all workers of both sexes in the village or locality have a right to membership and it is doubtful whether any person holding land has a right to stay away;

(ii) Under co-operative farming, ownership of land continues to vest in the members who contribute it, whereas under collective farming it passes to the society as a whole. It is not material to the definition of co-operative farming whether or not the individual owners have the right to withdraw their holdings physically from the co-operative farm though, according to most writers, they should have such a right. Where such right is denied to a retiring member it is essential that he should receive due compensation for the property finally surrendered by him. In a collective farm, however, its members can decidedly have no such right and, as the ownership of land had already passed to the farm or to the society, no question of compensation either arises;

(iii) A co-operative farm pays wages to workers, whether members or not, at prevailing rates and distributes net profit according to the value of the land and also of the live-stock and dead stock, if contributed. Or, it may adopt another procedure, *viz.* the net proceeds of the farm arrived at after deducting all the expenses of cultivation including payments to members for the use of their land in proportion to its value, wages paid to outsiders, cost of management and contributions to the reserve fund and other funds, if any are established, may be shared by members in proportion to the wages earned by each. The members of a collective farm, on the other hand, are entitled to a share in the net income only according to the number of labour days put in by them. That is, in a collective farm the participants have only one kind of income from the farm—that due to work; in a co-operative farm those who have contributed the land or stock are entitled to a dividend or an income on account of their contribution, apart from anything they may earn as workers on the farm.

Apart from these differences in the organisational set-up, there is no difference in the actual working of the two types. There is much greater significance in their similarities. Both are joint enterprises. Land, labour and capital resources are pooled both in a co-operative and a collective farm, and whatever production technique can be applied to one may be equally applied to the other. The effect on peasants-cum-labourers constituting the farm is similar in both cases and, from the point of view of agricultural production, there is nothing to chose between them. Whatever criticism applies to one applies equally to the other. That there is no substantial difference between co-operative and collective farming is further clear from the fact that the fourth and final form of agrarian organisation, which was once the ideal of the Chinese Communists, is called

by them an 'advanced co-operative'.

To call an agricultural producers' co-operative or the so-called co-operative farm as distinguished from a collective farm, a co-operative enterprise, will be a misnomer. A co-operative is an association of free autonomous economic units, whereas a co-operative farm consists of members who have lost their economic autonomy. A co-operative is intended to support the enterprise and the business activities of its members. This aim can only be realised if there are autonomous enterprises of the members who associate in order to support their individual enterprises. It cannot be the purpose of a co-operative association to dissolve the individual enterprises and replace them by a joint or collective enterprise. In a co-operative farm the identity of both the farm and the farmer disappears as completely as it does in a collective farm.

One cannot have much quarrel with the Planning Commission's Committee on Problems of Reorganisation. It leaves the suitable method of co-operative management to be evolved by experience. The Prime Minister restated the same approach in his address to the Uttar Pradesh Political Conference in Jaunpur on October 29, 1956. He said:

> .....the Government did not intend to proceed in the matter arbitrarily. It was for the *kisans* themselves to take into account the pros and cons of co-operation and, if they considered it to be useful for them and the country, they should adopt it. But to him, there appeared to be no alternative. At this stage all that he wanted was that they should discuss the matter among themselves thoroughly and try co-operatives as an experimental measure.

The first method advocated by the Planning Commission's Committee under which each family has a separate holding to cultivate is but a variant of what is known as a Better Farming Society. Co-operation is not stretched to the point of merger of holdings, but is limited to non-farm activities where it can find its most fruitful field in the domain of agriculture. This method will be acceptable to all; but the Planning Commission insists that "co-operative farming necessarily implies pooling of lands and joint management". The only concession it makes is that "at this stage of development" it is not prepared to recommend any particular "manner in which lands may be pooled and operated" (Second Five-Year Plan, p. 201). It is this insistence which compels a dispassionate examination of the available evidence for and against large-scale joint-farming. Such examination is all the more necessary in view of the fact that the most powerful political party in the country, *viz.*, the Indian National Congress has also, in its plenary session held at Nagpur in January, 1959, agreed with the Planning Commission and accepted joint farming as the ultimate pattern for India.

CHAPTER V

OUR PROBLEMS AND THE BASIC LIMITATION

It would be axiomatic to state that our economy, industrial or agrarian, should be governed by the conditions of our country and so regulated that it might help to solve the main problems that face us, or help to realise the ideals that we have in view. We cannot just copy or lift the agrarian economy obtaining in any particular country irrespective of the society that the latter hopes to build for itself, or irrespective of its conditions, geographical, climatic, and other which may or may not be applicable in our case. Now, the main problems that call for solution in our country, as in many others, can be formulated as follows:

(i) Increase of total wealth or production;
(ii) Elimination of unemployment and underemployment;
(iii) Equitable distribution of wealth; and
(iv) Making democracy a success.

All our laws, schemes, and projects have to be evaluated in the light of these problems. Those which serve to contribute to their solution are beneficial to the country. Those which do not, have to be rejected.

It will be found that, of the three alternatives mentioned in Chapter II, it is the first, *viz.* an economy of small farms operated by animal, or, if necessary, manual power, and individually worked, with such farms co-operatively linked with each other in all economic activities other than actual farming or production, which will best answer our needs and solve our problems taken together.

The form of agricultural organisation in a country will depend on the proportion in which the two factors of production, *viz.* labour and capital, either separately or more usually conjointly, are available in relation to the third, *viz.* land. The quantity of land that is available for production in our country today is, for all practical purposes, fixed; there is little possibility, as we shall see, of extension of agriculture by reclamation and colonisation. In other words, land is relatively scarce and constitutes the limiting factor. On the other hand, because of our great and increasing population, labour is cheap. That part of capital which provides traction power, *viz.* draught cattle, is, by no means, lacking, if not actually surplus to our needs. Our agrarian organisation has, therefore, of necessity, to be such as would lend itself to the maximum exploitation of land, as will give us maximum yield per acre, even though it may not be consistent

with the maximum exploitation of labour and capital. It is only in countries like the USA, Canada, Australia or New Zealand where land is not a limiting factor and labour is relatively scarce, that it may be in the national interest to obtain the maximum output per worker rather than maximum yield per acre. Such countries can afford to have an economy which may be wasteful of land. But we in India, where land is relatively so scarce and, therefore, more valuable than the other two factors, cannot but have an economy which is economical in its use of land resources, though it may be wasteful of labour and capital resources, that is, an economy where we have to apply to land more or increasing units of labour or capital, or of both in order that the fullest use may be made of the former, or, which is the same thing, bigger yields realised per acre. To quote W. J. Spillman: "The greatest profit from the business as a whole involves the greatest profit per unit of the limiting factor. Thus, if land be the limiting factor, the aim should be to make the largest profit per acre. If labour limits the business, the aim should be the largest possible profit per unit of labour. Similarly, if the limiting factor be materials, the aim should be the greatest profit per unit of material"[1]

Marxism, like capitalism, has everywhere asked: How could one obtain from the existing surface a maximum return with a minimum of labour? The question for us is different. It is: How could we on the existing surface secure a living to a maximum number of people through the use of their labour in the villages? Land being the limiting factor in our conditions, our aim must be, obviously, not the highest possible production per man or agricultural worker, but highest possible production per acre. That is what will give us the largest total for India as a whole and thus eradicate poverty or want of wealth in the absolute.

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[1] *The Law of Diminishing Returns*, p. 43.

CHAPTER VI

PRODUCTION OF WEALTH

(i) Size of Farm

A good few think that a compact area of 100 acres will yield a somewhat higher produce than 10 plots of 10 acres each. That is, concentration of land will give greater yield per acre than if it is divided or dispersed into small units. People living in the cities who have before them the example of big economic units working successfully in the field of manufacturing industry, argue by analogy that big mechanised undertakings would produce more in the field of agriculture also. They consider that increased production of food cannot be achieved unless the peasants abandon small-scale farming and join or merge themselves into societies where large-scale farming is possible and tractors, combine-harvesters and similar mechanical devices can profitably be used. They would like to put agriculture, too, on a factory basis.

The economists in our country and the intelligentsia, in general, have taken their views mostly from Marx, the core of whose economic analysis, as of his theory, was a fundamental belief in the superiority, and hence in the necessity, of large-scale production. To him large-scale production was the first condition for general well-being. That condition was clearly being realised in the field of industry; Marx took it for granted that the same process was bound to take place also in agriculture.

According to Marx the peasant was doomed because he was a peasant, and the evil to which the peasant was succumbing was just his dwarf holding. Neither the peasant nor his system was compatible with progress, and the development of the society was overcoming them both. The Communist Manifesto went straight to the goal—the scientific cultivation of the soil upon a common plan by means of armies of labourers.

The small peasant produces mainly for himself; the capitalist farmer mainly for the market. But capitalist farming was obnoxious to the very principle of communism and, as the industrial workers depended on purchased food-stuffs and these, the Communists said, could not be obtained from the peasants, the old peasant economy was incompatible with the new industrialised state. The peasant was, therefore, to be transformed into a labourer and the nationalised soil tilled by co-operatives of production under the control of society as a whole.

As has been pointed out by David Mitrany,[1] no part of Marx's economic theory was more uncritically accepted than this. It was forgotten that when Marx was formulating his theory he was living in England where there were no peasants and no agrarian questions to challenge his outlook. His description of the agricultural situation was based on the life of the English labourer and of the pitiable Irish peasantry about the middle of the last century. It was, further, a period when everything seemed to point to concentration of land in the hands of a few large owners. An important aspect of this phenomenon. *viz.* that the increase in large estates had often been achieved by political and social pressure (through enclosures and partly as the price for emancipation of the peasants), and did not represent simply the victory of the better system in free competition, escaped his notice completely. The original views of Marx on agrarian development have, however, continued to grip the communist mind ever since, in spite of the statement of Engels that Marx had himself begun to doubt their validity in cases where, as in Eastern Europe, farming was not capitalistic.

The explanation why, as a consequence of an increased scale of output, a manufacturer can expect to obtain increasing returns per unit of labour or other economic resources employed, while a farmer cannot, lies in the fundamental difference between the two kinds of industry, which has been admirably brought out by Van Der Post. "The manufacturing process", says he, "is a mechanical process producing articles to pattern in succession from the same machine. The agricultural process, on the other hand, is a biological process, and its products are the result not of a man-driven mechanism, but of their own inherent qualities of growth. In the case of the industrial commodity, therefore, standing room for a machine and its operator will suffice in order that it be multiplied indefinitely. In the case of the agricultural commodity, on the other hand, standing room is required for each article that has to be produced."[2]

From this fundamental difference between the nature of the two industries stem several other differences that characterise their working and also affect the size of the industrial and agricultural undertakings.

Agriculture depends on the area of land—on the area in which plants can spread their roots and expose their leaves to the sun, and from which they can draw water and chemical substances necessary for their growth. A plant will take the same space to grow, whether it is sown in a small farm or large, so that a large farm has no advantage over a small farm in per-acre production. Provided, there-

[1] *Marx Against the Peasant*, London, 1952, Part I, Chapter I.
[2] *Economics of Agriculture*, p. 162.

fore, there is no difference in farming methods and capital employed per man is equal, returns per man will diminish as an increasing number of men is put to farm a limited area of land, because the men have, on an average, less area to work with. At the same time, as more men cultivate the land, returns per acre will increase, because each acre has more labour applied to it. Thus, two men working ten acres of land can produce more than one man working those ten acres, and three men working the same area can produce more than two men. But the increase in product per acre, with the increase in the number of workers, is a diminishing increase: the increase in product is in lower proportion than the proportion by which the number of workers increases. 'Two men working the ten acres cannot produce double of what the one previously working them was doing; nor can three men produce as much per man as each of the two men. In other words, each equal additional quantity of work bestowed on agriculture yields an actually diminishing return, and this is what is called the 'Law of Diminishing Returns' in agriculture. It can also be described and, perhaps, more correctly, the 'Law of Diminishing Increments'.

"Except for diminishing returns", says Dr. Elmer Pendell[1], "quantity of land in the world, or in one country, or on one farm, would have no relation to quantity of production. Except for diminishing returns, a twenty-acre farm would produce as much as a thousand-acre farm. If additional volumes of crops could be had in proportion to capital and labour put on the land, a given outlay of capital and labour would produce as much on a small acreage as on a large acreage".

On the other hand, manufacturing is not dependent on area. If need be, it can also expand upwards. Land, therefore, does not enter substantially into the calculations of manufacturing or its production. Manufacturing deals with materials, *viz.*, labour, machines and other capital, which are not constant or limiting factors like land. Labour is increasing daily and capital can be created by efforts of man. Thus, manufacturing in most branches can be and is carried out in such a way that product per man or other economic resources employed, rises as the scale of industry is increased. This means that manufacturing works under the law of increasing returns. Manufacturing units, therefore, tend to grow big, which cannot be true of agricultural units.

Dependence of agriculture on area means that larger the size of the farm, the more scattered its operations. This not only makes large farming more expensive than large manufacturing, but makes it more difficult to supervise. Men concentrated under one roof, as

[1] *Population on the Loose*, New York, 1951, p. 40.

is the case with manufacturing, are easier to supervise, than men spread over a large area.

Besides area or space there is the time factor which tends to push up the size of an industrial undertaking as compared with agricultural. In manufacturing, as the size of the machine or industrial plant increases, there is greater and greater operational and functional division of labour and, therefore, less and less time is taken in turning out a given quantity of product than before. Such economy or economies, called 'internal economies of scale', are the result of improvements in organisation within an industrial enterprise, which become possible because its scale and, therefore, its output is large. No such internal economies, however, are possible in the sphere of agriculture where time, like space, is an irreducible minimum which remains unaffected by the size of the enterprise. An agricultural plant will take the same time to mature, whether it is sown in a small farm or large.

While manufacturing lends itself to specialization by tasks and by products and its production can be standardized, agriculture and its production, thanks to its biological character and, therefore, its dependence so primarily on local and particular contexts and imponderable factors like weather, cannot. Manufacturing, therefore, needs less supervision than agriculture and is susceptible to delegation and differentiation of managerial functions much better. These factors favour a larger scale of operations in manufacturing than in agriculture.

Further, crops (and cattle) need not only more intimate, affectionate and devoted care—they need a twenty-four hours' care. A workshop has its hours of working and closure, but agriculture simply has no closing hours. Necessarily, this distinguishing feature makes a lot of difference in the scale of undertaking in the two spheres.

The invention of the steam-engine in the eighteenth century led to an unparalleled economic revolution involving a complete upheaval in methods and rates of industrial production and in civilization in general. Where hitherto man had scarcely known or used any but hand tools, he had henceforth at his disposal a machine driven by an external source of power, which could be harnessed to an indefinite number of other machines.

The great inventions heralding the birth of the capitalist economy, demanded large numbers of workers, heavy capital investment and world-wide markets. The handicraft workshop in which the master-craftsman worked alongside a few journeymen or apprentices gave way to the factory and the big firm in which concentration and the scale of production steadily increased and the machines were constantly improved.

While, however, introduction of the steam-engine brought a hundredfold, even a two hundredfold increase in man's capacity to produce manufactured goods in a given time and space, it did nothing of the kind in agriculture, which is a biological process. Mechanised equipment does not overcome the most important conditions limiting agricultural yields, *viz.*, natural fertility of the soil and climatic conditions. In mechanical processing, replacement of hand power by steam power established a new relationship between the size of an undertaking and its production. But it could not influence life process of plants, and the relationship between the size of an agricultural farm and its production necessarily remained unaffected. It was an 'Industrial Revolution' as it is rightly called, not an 'Agricultural Revolution.'

However, while in sheer theory, the size of the farm, in and of itself, did not affect production per acre, in actual practice and for reasons following, given the same resource facilities, soil content and climate, a small farm produces, acre for acre, more than a large one—howsoever organised, whether co-operatively, collectively or on a capitalistic basis. And it will continue to produce more, until a device is discovered which can accelerate nature's process of gestation and growth.

A plant is a living organism. As such it requires individual care and attention somewhat in the same manner as an animal or human being does. In industry a worker can be 'functionally' efficient even if he is utterly uninterested in the work, because work is highly routinised, impersonalised and mechanised. But farming is not a matter of routine. The yield of the land depends directly on the care with which the farmer conserves the soil and protects the crop. And there are limits to the physical and supervisory capacity of the owner or the manager of the farm—to the regard and solicitude which he can bestow. As no man or woman can satisfactorily look after two dozen cows or two dozen children, so no farmer can tend crops efficiently beyond a certain area or limit.

Nor can such care and attention be forthcoming on a co-operative or collective farm either, where no land or field belongs or is entrusted to anybody, exclusively. Distributed responsibility or responsibility of the many which a co-operative or a collective enterprise involves, unless its members are close blood relations, or are inspired by high idealism, which in the economic sphere of human life is rare, will ultimately boil down to the responsibility of no one, and cannot take the place of individual interest which alone can provide the close, constant and intimate attention that lands and crops require.

Secondly, a peasant farmer and his family are underemployed on their patch of land. They do not have to pay for the time and the labour that they devote to it, so that even for a small extra yield they will apply all the labour they are capable of. In peasant farming land is the limiting factor, and the greatest profits, therefore, lie in the maximum yield per acre. On the contrary, the owner of a big farm has necessarily to engage labour on payment, and unless the extra yield is commensurate with the extra labour that may be applied, the extra labour will not be worth-while. In his case labour is the limiting factor, not land; for, land is there to which extra labour may be employed but it is too costly for the additional output. The maximum profits in the case of a big farmer will not, therefore, correspond to the maximum yield from land as in the case of a small farmer, but to maximum exploitation of labour.

In this context it may not be irrelevant to point to a non-economic consideration which tends to work against a large farmer and in favour of a small one. Paid labourers can in no case bring to apply the same attention, the same devotion which members of a peasant family will, whether in tending the crops or the animals or in performing any other of the varied tasks of cultivation. Agriculture for a peasant is not only a means of living, but a way of life also. His wife, children and old parents labour not merely for gain. Whereas the labourers work for wages, not for love.

If the large farm is a co-operative or collective undertaking, the workers or members will lack the incentive, which a peasant farmer owning his patch of land and being master of his produce has, for working hard. The knowledge that the total sum to be divided amongst more than a hundred or two hundred workers of the co-operative farm depends upon how hard they all work, has proved too weak and diffused an incentive to be effective. "The farmer will not," write Sydney and Beatrice Webb, "be easily weaned from his habit of seeking always to do less work than his fellow-members, on the argument that only in this way can he hope to 'get even' with them, as they will, of course, be seeking to do less work than he does".[1] That is, the pace in a co-operative or collective enterprise is determined by that of the slowest worker.

"Generally experts, who advocate co-operative farming", says Dr. Otto Schiller, a German Professor of Agricultural Economics, "have in mind that in contrast to what happened in Soviet Russia, the ownership of land should be preserved at least as a title. But

[1] *Soviet Communism: A New Civilisation*, Longmans & Green Co. Ltd., London, 1937, p. 218.

it is still questionable whether a legal title to a piece of land which still exists in the records but has in fact disappeared as a visible unit in the fields, can provide the same incentive as real possession of the land, even if the profits of co-operative farming are shared according to the assessed value of the land contributed by each member."[1]

Right of ownership in property, in the ultimate analysis, means only right to control the property—to use it in any manner the owner likes or not to use it at all. Once this right to control disappears or is taken away, ownership is reduced to a myth. Those who argue that farmers need not apprehend liquidation of their individual ownership, because it would continue in the form of shares in the society on which dividends would be paid, ignore the basic fact that land to a farmer is much more than money or shares in a company—that it is land which ultimately is the producer of food and all kinds of wealth, and, while other forms of property may be destroyed, land abides for ever.

Thirdly, a peasant farmer, by dint of the surplus labour resources of his family available to him, is able to carry more cattle per acre than the large farmer. His family labour is a fixed factor which has to be maintained at all events: so he tries to utilize it by keeping live-stock, which adds to his output. No such labour force, or labour force commensurate to the size of the farm is available to a large farmer. Almost all the income is, therefore, confined to what the farmer is able to get from the crops.

Similarly, the capacity of a large farm to rear and maintain cattle is not enhanced by its being run on co-operative or collective lines. Cattle and poultry respond to gentle and affectionate treatment almost just as human beings do. They are, therefore, best cared for only when they are objects of pride to their proprietors. If it were not so, far greater concessions in the matter of keeping private livestock would not have been given to collective farmers in those areas of the USSR which are devoted largely to breeding of cattle as opposed to areas devoted largely to production of grain.

Lastly, inasmuch as a family farm can carry a larger number of cattle and poultry per acre than a big farm, the peasant farmer will have comparatively more farmyard manure at his disposal. Cattle waste is organic in character, and, at least, in the long run more effective as manure than the inorganic chemical fertilisers which are obtainable in the markets. A large farm, whether private or co-operative, will, of necessity, resort to these fertilizers, since a tractor and a harvester combine produce no muck or organic manure.

[1] *Co-operative Farming and Individual Farming on Co-operative Lines*, pp. 11-12.

And while the truth that farmyard manure helps to maintain soil fertility best is admitted by all agrarian experts, some of them, at least, are definitely of opinion that artificial fertilizer depletes the soil.

> It may be pointed out here, in parenthesis, that since the great depression of the thirties, doubts about the efficiency of large units have grown even in the field of industry. A most thorough investigation was made to this effect by the so-called Temporary National Economic Committee in the USA, just before the War, in 1941. Its elaborate studies showed that in none of the mass industries were the biggest units the most efficient in productivity. In a practical way the depression of the thirties had also served to show that even in manufacturing smaller units could more readily adapt themselves to changing conditions and markets.

(ii) Comparative Data of Yields

The conclusion, we had reached in the previous sub-chapter, that production on small farms should be greater per acre of land than on large farms, or, in other words, production per acre will increase as the number of men cultivating a given piece of land increases, is well illustrated by the following table taken from Dr. Elmer Pendell's *Population on the Loose*, New York, 1951, page 37 (Table on next page).

Clearly there is less production per man if more than four men work the 100 acres. The more the workers, the less is their per capita production. Dr. Elmer Pendell says that he chose soil which was not very good and where the farmers had only a little help from tools. Nor would tools make a difference, to per capita production, at least, when as many as 18 men have to support themselves on a hundred acres. For, less the ground a man has, less the advantage he has in the use of farming equipment.

According to Dr. Elmer Pendell:—

> As we proceed down a scale of diminishing returns we eventually arrive at an absolute maximum total and an absolute maximum per acre average. The total production will go up no further with further increases of manpower, and will actually go down instead—further and further down....
>
> We get valuable light on the whole problem by taking a look at China.
>
> John Lossing Buck, in *Land Utilisation in China*, a 1937 book published by the University of Chicago Press, reported the results of an extensive study of Chinese farms. He classified the farms by size into five groups. Simplifying the data on his page 283, we get this:
>
> There we have a striking statistical showing of diminishing returns. It is something like our other table except that this one shows a condition at a subsistence level and an arrival at an actually declining yield per acre. (*Ibid*, pp. 57-58).

TABLE I

Illustration of the Law of Diminishing Returns

No. of men working the land	Acres of land worked by the total no. of men	Total Production of the hundred acres in equivalent of bushels of grain	Production in bushel of grain attributable to the man in the series who is now considered for the first time	Average production per man, in bushels	Average production per acre in bushels
1	100	200	200	200.00	2.00
2	100	500	300	250.00	5.00
3	100	900	400	300.00	9.00
4	100	1,250	350	312.50	12.50
5	100	1,540	290	308.00	15.40
6	100	1,780	240	296.67	17.80
7	100	1,980	200	282.85	19.80
8	100	2,150	170	268.75	21.50
9	100	2,300	150	255.55	23.00
10	100	2,440	140	244.00	24.40
11	100	2,575	135	234.09	25.75
12	100	2,705	130	225.42	27.05
13	100	2,830	125	217.69	28.30
14	100	2,950	120	210.71	29.50
15	100	3,067	117	204.47	30.67
16	100	3,181	114	198.81	31.81
17	100	3,292	111	193.65	32.92
18	100	3,400	108	188.88	34.00

TABLE II

Production on Chinese Farms

Farm Group	Men equivalent per 100 crop acres	Crop acres per man equivalent	Production per man equivalent in equivalents of bushels of grain	Production per acre in equivalents of bushels of grain
A ...	25.00	4.0	76.1	19.0
B ...	31.25	3.2	62.0	19.4
C ...	38.46	2.6	53.5	20.6
D ...	47.62	2.1	43.1	20.5
E ...	66.67	1.5	30.6	20.4

It will be seen that under conditions of manual and animal labour, or conditions where large agricultural machinery is not used, as more and more men work a given land area, that is, as the farm becomes smaller and smaller, production both per acre and also per man (or worker) increases till land per man is reduced to a point between 33.3 and 25 acres—say, 30 acres. After 30 acres, the law of diminishing returns begins to operate and production per man begins to decrease. Production per acre, however, continues to increase, though by smaller and smaller increments, till land per man is reduced to a point between 2.6 and 2.1 acres—say, 2.5 acres.

It would seem from table II above that when a man has less than 2.5 acres of land, production per acre also begins to decrease. Possibly, it is only a chance variation or decrease that production on Chinese farms belonging to groups, D and E, shows in the above table. This decrease is so negligible that no inferences can be drawn on its basis. Or, for ought one knows, there may be a psychological reason affecting the farmer's mind which is responsible for the decrease. At least, there is no physical reason. All that can safely be said is that there is a limit after or beyond which Mother Earth refuses to yield to human coaxing any further—when there are no additional returns due to additional application of labour. This limit, according to Chinese statistics, is reached when the area per man is reduced to 2.5 acres.

There is overwhelming factual evidence from various other countries also which establishes that the return per acre goes up as the

size of an agricultural holding goes down. Below are given figures for the English, Danish and Swiss agriculture[1]:—

TABLE III

	ENGLISH		DANISH		SWISS	
	Size of Holding in acres	Gross return per acre £. s. d.	Size of Holding in acres	Gross return per acre £. s. d.	Size of Holding in acres	Gross return per acre £. s. d.
1.	...		Under 25	20 1 0		
2.	1 to 50	11 19 9	25 to 50	15 4 0	7½ to 12½	22 11 7
3.	50 to 100	9 19 2	50 to 75	15 3 0	12½ to 25	19 0 3
4.	100 to 150	7 19 1	75 to 100	13 18 0	25 to 87½	17 17 2
5.	150 to 250	7 5 8	100 to 250	12 8 0	87½ to 75	16 2 3
6.	Above 250	7 4 4	Above 250	12 4 0	Above 75	13 17 7

Frank App remarks in *Farm Economics* (pp. 58-59):

It is quite evident that the larger the business, the larger will be the receipts. To what extent this would hold true as the size increases, will depend upon the type of farming, the locality, and somewhat upon the ability of the operator. In the surveys made in six states of the USA the results average as follows:—

TABLE IV

FARM SIZE	TOTAL RECEIPTS PER ACRE
Small	$ 42.90
Medium	$ 42.30
Large	$ 38.80

That mixed farming (or even cattle-rearing singly) is more profitable on smaller farms than on larger, is well illustrated by the statistics of five different countries given in Table V on the next page.

That contribution of dairy to total output on smaller holdings is higher than on larger holdings, is illustrated by the following table also which has been taken from *Studies in Economics of Farm*

[1] *Economics of Agriculture* by Van Der Post, 1937, pp. 170-175.

TABLE V

Gross Output Per Acre

	DENMARK			NORWAY			SWEDEN			SWITZERLAND			CARMARTHENSHIRE (AN ENGLISH COUNTY)		
	Under 25 acres	25—50 acres	50—75 acres	Under 25 acres	25—50 acres	50—75 acres	Under 25 acres	25—50 acres	50—75 acres	Under 25 acres	25—50 acres	50—75 acres	Under 25 acres	25—50 acres	50—75 acres
	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.
Crops ...	1 11 7	1 4 4	1 13 5	3 7 1	3 2 11	2 14 7	1 2 5	1 4 4	1 18 8	2 3 4	1 19 1	2 1 11	0 0 1	0 1 9	0 0 1
Livestock and livestock products	20 14 5	15 18 8	14 7 1	12 17 6	9 16 5	8 9 10	10 5 3	6 15 1	6 19 10	12 7 2	12 11 0	11 6 5	7 14 8	7 10 8	7 3 7
Other sources.	1 7 0	0 15 3	0 12 7	1 18 10	1 1 6	0 19 7	0 17 8	0 10 1	0 17 2	6 3 3	5 10 7	4 2 5	11 19 10	1 0 5	0 15 10
	23 13 0	17 18 3	16 13 1	18 3 5	14 0 10	12 4 0	12 5 4	8 9 6	9 15 8	20 13 9	20 0 8	17 10 9	19 14 7	8 12 10	7 19 6

Source: *The Economics of Small Holdings*, (1927), Edgar Thomas (pp. 10-11)

Management in Uttar Pradesh (1957) undertaken at the instance of the Government of India under the guidance of Dr. G. D. Agarwal, recently of the Government Agriculture College, Kanpur, in districts of Meerut and Muzaffarnagar in 1954-55 (p. 53)—

TABLE VI

Percentage Contribution of Crops and Milk Products to Total Output

SIZE-GROUP (ACRES)	CROP	MILK AND MILK PRODUCTS
Below 5	77.2	22.8
5—10	83.5	16.5
10—15	88.1	11.9
15—20	89.6	10.4
Above 20	91.1	8.9
All Holdings	86.5	13.5

The explanation lies in the fact that although the number of milch cattle per holding is smaller on smaller holdings as compared with larger holdings, yet on per acre basis it is considerably larger on smaller holdings.

It is not only gross production per acre that increases with the decreasing size of the farm; there is evidence to show that this is true also of net production. David Mitrany, the author of *The Land and the Peasant in Rumania*, says on page 254 of his book:

> The progress in the science of agriculture has shown that the laws of industrial production do not also hold good for the production of food-stuffs. In agriculture, production follows a natural process which does not allow an indefinite division of labour; and this form of intensifying production has been proved to bring in returns which, for a number of reasons, diminish in the proportion in which the size of the agricultural undertaking increases, as illustrated by the so-called circles of Thunen. More recent inquiries have shown that this is true not only of the total output which was often conceded but also of net production. It might be useful to quote here one inquiry, because of its clear results and of the great competence of its author. The Director of the Swiss Peasant Secretariat, Prof. Ernest Laur, who is also a member of the League of Nations Committee on Agricultural Questions, worked over returns on capital for

various categories of Swiss farms over a period of twenty years (1901-21), and has obtained the following averages, in Swiss francs:

TABLE VII

SIZE OF FARM IN HECTARES	VALUE OF TOTAL PRODUCTION PER HECTARE	VALUE OF SOLD PRODUCE PER HECTARE
3—5	1,180	795
5—10	1,005	740
10—15	900	700
15—30	825	660
Above 30	710	595

Similar results have been obtained from a survey[1] conducted by a method close to the purposive selection method, on behalf of the Indian Peasants' Institute in Nidubrolu during 1957. The area selected was of 10 square miles in Divi Taluq, Krishna District in Andhra Pradesh, which contains rich black-cotton soil and is inhabited by efficient and hard-working peasants—*vide* Table VIII on p. 35.

A report of the British Ministry of Agriculture referred to in the monthly journal, *The Agricultural Situation in India: April, 1952*, issued by the Economic and Statistical Adviser to Government of India also points to the conclusion that net output per acre is highest on the small farms and declines as the size of farm increases—

TABLE IX: *Net Output Per* 100 *Adjusted*[2] *Acres*

FARM SIZE GROUP (Acres)	1947-48	1948-49
0—50	2,565	3,188
51—100	1,830	2,319
101—150	1,575	2,025
151—300	1,576	2,033
301—500	1,577	1,980
Over 500	1,551	1,923

[1] *The Peasant and Co-operative Farming*, by Prof. N. G. Ranga and P. R. Paruchuri, published by the Indian Peasants' Institute, Nidubrolu and printed at the New Indian Press, New Delhi, 1957, p. 83.

[2] Adjusted acreage of a farm means the actual area in sole occupation reduced by expressing the acreage of any rough grazing in terms of equivalent acres of crop and grass, which vary from district to district according to local conditions.

TABLE VIII: *The Size of Holdings, Costs and Production*

Size of holdings (in acres)	Value of the gross produce per acre[1]	Average No. of unpaid family workers	No. of annual farm servants engaged on the holding	Total man-days of labour per acre in a year	Total paid costs per acre[2]	Percentage of paid costs to the value of gross produce	Total costs per acre if family labour is remunerated on par with the annual paid farm servants	Percentage of total costs (including remuneration to family workers) to the value of gross produce	Producer's surplus per acre (including the remuneration to family workers), that is, column 2 minus column 6	Percentage of producer's surplus to the value of gross produce
1	2	3	4	5	6	7	8	9	10	11
	Rs.				Rs.		Rs.		Rs.	
3—5 ...	391.50	2	0.50	241	146.00	37.29	335.00	85.57	245.50	62.71
8—10 ...	382.50	2	1.25	149	150.75	39.41	237.00	61.96	231.25	60.46
13—15 ...	380.25	1.50	1.50	102	143.75	37.80	184.25	48.45	236.50	62.20
28—30 ...	355.50	1	3	75	150.12	42.23	162.62	48.47	205.38	57.78
42—45 ...	326.25	1	6	87	176.75	54.18	185.55	56.87	149.50	45.82
55—60 ...	317.25	0	8	89	200.75	63.28	200.75	63.28	116.50	36.72
70—75 ...	279.00	0	10	95	212.75	76.25	212.75	76.25	66.25	23.75
90—100 ...	243 00	0	9	73	172.00	70.78	172 00	70.78	71 00	29 22

1 The value of the gross produce in column 2 is not arrived at on the basis of the price at which farmers actually sold their produce but only by multiplying the physical gross produce with the average of the market price in the specific month of 4 years, under the assumption that multi-purpose co-operatives exist.

2 Total of the wages of hired labour, out-of-pocket expenditure incurred on draught animals, cost of seeds, out-of-pocket expenditure incurred on manures (the real value of the manure available on the farm itself being not calculated or included), depreciation and maintenance cost of farm-sheds and agricultural implements, land revenue, managerial costs, if any have been paid, and miscellaneous costs.

Source—Ranga and Paruchuri, *Ibid.*—Condensed from the tables on pp. 86-88.

According to an address delivered by Professor Sering in the Emperor's presence before the German Agricultural Council in 1913, quoted in a memorandum submitted to the British Agricultural Tribunal of Investigation in 1924—"The evidence is conclusive that the new peasant holdings in the eastern provinces not only doubled the number of inhabitants in the colonized area—and that within ten years; they increased the cattle in the area from two to threefold; the pigs from three to fourfold; while the grain crops were, in some cases, half as large, again in others doubled. This was, of course, only by dint of harder work than mere hired labourers would care to perform, and by making use of their children and women and old people to do the extra harvest work for which the great land-owners had to rely on Polish season workers."

These peasant holdings had come into being consequent on the division of large estates.

In Poland the change from extensive corn growing to small-scale mixed farming showed great capacity for expansion in that direction. The number of animals (apart from improvement in quality) increased as follows between 1921 and 1938-39:

TABLE X

	(1921)	(1938-39)
	(in millions)	
Cattle	7.89	10.6
Pigs	4.8	7.7
Sheep	2.5	3.2

In Czechoslovakia the division of the large estates resulted in an improvement in the number and quality of livestock, an increase in milk production and even a rise in corn yields, because more livestock meant more manure.[1]

The British Agricultural Tribunal of Investigation has the following comment to make about the family farm, that is, the farm worked by the occupier and members of his family with or without some hired labour:

> We believe that the productivity of European agriculture, particularly, of that of Denmark, Germany and Belgium, where the output has been the greatest, has been largely due to the attention given to the organisation of the family farming system; and in Denmark which still offers the most instructive field for comparison, the maintenance and extension of the system have been regarded as the most secure foundation for obtaining the maximum out of the land, while,

[1] David Mitrany's *Marx Against the Peasant*, London, 1952, p. 127.

at the same time, developing a democratic and rural social community. (Report: 1924, p. 87)

Below is given a table showing the average production of some of the agricultural commodities for USA, UK, several western European countries and Japan.

TABLE XI: *Average Yield per Hectare* (in 100 KGMS) *during* 1948-53[1]

Sl. No.	Countries	Wheat Actual	Wheat Relative (USA=1)	Tobacco Actual	Tobacco Relative (USA=1)	Barley Actual	Barley Relative (USA=1)
1	U. S. A. ...	11.3	(1.0)	14.2	(1.0)	14.4	(1.0)
2	U. K. ...	27.7	(2.5)	...	...	25.7	(1.8)
3	Denmark ...	37.0	(3.3)	8.6	(0.6)	34.5	(2.4)
4	France ...	18.9	(1.7)	17.6	(1.2)	16.5	(1.1)
5	Federal Republic of Germany	26.3	(2.3)	24.6	(1.7)	24.2	(1.7)
6	Belgium ...	32.3	(2.9)	22.9	(1.6)	30.1	(2.1)
7	Netherlands ...	37.0	(3.3)	...	...	32.4	(2.3)
8	Norway ...	20.6	(1.8)	...	...	23.4	(1.6)
9	Sweden ...	21.7	(1.9)	...	...	22.3	(1.5)
10	Switzerland ...	26.4	(2.3)	19.4	(1.4)	24.7	(1.7)
11	Japan ...	18.8	(1.7)	16.8	(1.2)	21.0	(1.4)

1. Main crops only.
Source: FAO Year Books, 1953 and 1954

TABLE XI—(*concld.*) *Average Yield per Hectare* (IN 100 KGMS.) *during* 1948-53[2]

Sl. No.	Countries	Maize Actual	Maize Relative (USA=1)	Rice (Paddy) Actual	Rice (Paddy) Relative (USA=1)	Potato Actual	Potato Relative (USA=1)
1	U. S. A. ...	24.4	(1.0)	26.2	(1.0)	162.5	(1.0)
2	U. K. ...	...	...	...	...	193.3	(1.2)
3	Denmark ...	...	...	...	...	190.3	(1.2)
4	France ...	14.9	(0.6)	35.3	(1.3)	127.8	(0.8)
5	Federal Republic of Germany	23.0	(0.9)	...	...	212.0	(1.3)
6	Belgium ...	39.0	(1.6)	...	...	232.2	(1.4)
7	Netherlands ...	32.4	(1.3)	...	...	255.8	(1.6)
8	Norway ...	...	...	...	...	200.5	(1.2)
9	Sweden ...	...	...	...	...	136.3	(0.8)
10	Switzerland ...	31.0	(1.3)	...	...	182.2	(1.1)
11	Japan ...	14.2	(0.6)	39.1	(1.5)	119.2	(0.7)

2. Main crops only.
Source: FAO Year-Books, 1953 and 1954.

The arable part of an average USA holding according to the 1950 World Census of Agriculture comes to 64 acres out of 215, i.e. 29.5 per cent of the total area. The average arable holding in western European countries is far smaller, even less than one-half and one-sixth of the average arable holding in the USA. It is 10 acres out of 27 in Federal Republic of Germany. The entire average holding in England, Denmark, France, Switzerland and Netherlands has only an area of 82, 39, 29, 15 and 14 acres respectively as compared with 215 acres in the USA. The average holding in Japan is far too small—one-thirtieth of the American arable holding, i.e. two acres (including pasture land) as compared with 64 arable acres. However, the USA is seen to produce less than almost all the countries given in the above table, even less than Japan where the average holdings are comparatively so small. It may be admitted that there are differences in topography, soil fertility, climatic conditions and the resource facilities that may be available to the farmers in the various countries, and, therefore, the figures of production are not strictly comparable. Yet the wide disparity in agricultural production in these countries, all of which are situated in the temperate zone and fall within the category of 'developed countries', cannot in its entirety be explained by these differences alone. The figures can, at least, be taken to point towards the conclusion that mere largeness of the size of an agricultural undertaking does not lead to increase in production per acre.

Whatever evidence is available of Russian collective farming also proves that concentration of land does not increase production per unit. Although "reliable statistics are not available", says Milovan Djilas, till recently Vice-President of Yugoslavia, "yet all evidence confirms that yields per acre in the USSR have not been increased over the yields in Czarist Russia, and that the number of livestock still does not approach the pre-revolutionary figure".[1]

Collective farms in the USSR which numbered 2,60,000 in 1952 were reduced by amalgamation to 91,000 in 1955 and the average size rose to 5,230 hectares (12,918 acres), of which 38 per cent is cultivated. Besides, there are 5,140 state farms with an average size of 30,800 hectares (76,076 acres), of which only 17.6 per cent is cultivated. The main aim of amalgamation and enlargement of collective farms was to increase their productive capacity. But we do not think there are any who can seriously contend that the aim has been realised—that agricultural production in the USSR has increased with the increase in the size of the agricultural under-

[1] *The New Class*, Thames and Hudson, 1957, p. 57.

taking. Constant shifts in internal reorganisation,[1] a drive to bring millions of hectares of hitherto uncultivated land under cultivation and Nikita Khrushchev's criticism of a number of ministers, ministries and state and collective farms at the closing of the Siberian farmers' conference in July, 1956, which clearly bespoke frustration, point to the contrary, *viz.*, to the fact that large farms do not mean large production and the expectations of the founders have not borne fruit.

A table is given below, from which we can easily deduce that large area of culturable land per man engaged in agriculture (or large size of the agricultural undertaking) does not mean large production per acre. The preceding table enabled us to take a comparison of agricultural yields of some countries with those of the USA. The following will enable us to make a similar comparison with the USSR. It will be found that, leaving out of account India and Philippines altogether, (for they are acknowledgedly underdeveloped countries,) the USSR, pride of the protagonists of large-scale mechanised farming, is bracketed with Turkey and Yugoslavia and occupies the lowest place, both as regards production per acre and production per man—

TABLE XII

Classification of 26 countries with respect to the relationship between the intensiveness of cultivation and agricultural output per person engaged in cultivation

Value of agricultural production per person engaged* (Rs. per year)	No. of persons engaged in agriculture per sq. kilometer of cultivable land					
	0—5	5—10	10—15	15—20	20—25	25—80
Below 1,000	...	Philippines	...	...	...	India
1,000-1,500	...	...	Turkey Yugoslavia U.S.S.R.	...	...	...

* Value of agricultural production has been given in terms of Indian rupee prices of the year 1948-49.

[1] Till 1958 all the MTSs, whose number rose from 158 in 1930 to some 7,000 prior to the outbreak of the last war, to 8,400 in 1954 and to more than 9,000 in 1957, have been run by the State. But after a two-day session held on February 25 and 26, 1958, the Central Committee of the Communist Party of Soviet Union decided to transfer the tractors and farm machinery from MTS' to direct ownership of collective farms. According to official Party admission, the system had been a brake on production. "As a matter of fact", the official communique went on to announce, "there were many cases in which stations even hampered the progress of outstanding collective farms and throttled the initiative among farm personnel." Peasants have also been freed from payment of compulsory food deliveries.

Value of agricultural production per person engaged* (Rs. per year)	No. of persons engaged in agriculture per sq. kilometer of cultivable land					
	0—5	5—10	10—15	15—20	20—25	25—30
1,500-2,000	...	...	Poland	Rumania	...	Italy
2,000-2,500	Brazil	Greece	Cyprus Bulgaria	Portugal	...	...
2,500-3,000	...	France Austria	Spain	...	Hungary	...
3,000-3,500	Sweden	Ireland	Syria	...	...	...
3,500-4,000	...	...	Germany Czecho-slovakia	Belgium	...	...
4,000-4,500	...	...	...	...	...	...
4,500-5,000	...	Britain	...	Nether-lands	...	...
Over 5,000	...	...	Denmark	...	...	...

Source: An article entitled, '*Population Growth And Living Standards*' by Colin Clark, published in the 'International Labour Review,' August, 1958.

If we take mean figures both for agricultural production per acre and per person engaged in agriculture and treat the production of USSR as 100, we arrive at the following table which will, perhaps, be more intelligible to a layman—(*Table XIII page 41*).

Again, it may be conceded that there is a difference in soil fertility and climatic conditions of the various countries mentioned in the following table. But this difference in conditions can, at most, be taken to explain the difference in production only where the cultivable land per person engaged in agriculture is equal or nearly equal, that is, higher production per acre in the eight countries mentioned in the left-half of the table, as compared with that in the USSR, may be due to their superior soil and climate. It will, however, be straining one's credulity too far to believe or to ask one

TABLE XIII

Countries which have about the same area of cultivable land per person engaged in agriculture as in USSR		Countries which have a smaller area of cultivable land per person engaged in agriculture than in USSR		
Country	Index of production per acre (and, therefore, per person)	Country	INDEX OF PRODUCTION	
			Per acre	Per person
USSR	100	USSR	100	100
Poland	140	Rumania	196	140
Cyprus & Bulgaria	180	Italy	252	140
Spain ...	220	Portugal	308	180
Syria ...	260	Hungary	396	220
Germany & Czechoslovakia	300	Belgium	420	300
Denmark ...	420	Netherlands	532	380

to believe that higher production per person of the six countries mentioned in the right-half of the table where the area of cultivable land per person engaged in agriculture is smaller than that in the USSR, is also due to this difference in soil and climate, particularly, when the claims of the Soviet Union regarding progress in agricultural research and availability of resource facilities on its state and collective farms are so wide and insistent. It will, therefore, be fair, by all standards, to conclude that the size of its agricultural undertaking, which is hundred times or more than that in any other country shown in the table, has not only not helped the USSR increase its agricultural output but, on the contrary, depressed it.

Taking the world as a whole, the Food and Agriculture Organisation of the United Nations has recently put out a very valuable survey called *Co-operatives and Land Use* published under its official auspices. On the general problem as to whether co-operative farming is more productive than peasant farming, the report says—"There is much evidence that the rural standard of living in countries extensively collectivised is below that of countries in similar latitudes where farming is individual."*

We may apprehend the same results in China, in India, or, for that matter, in any other country which adopts the agricultural pattern of the USSR. Reasons are not far to seek. To repeat them: incentives for hard work which operate in individual farming and tend to increase its production are absent in large-scale joint farming.

Recently studies on the economics of farm management were undertaken by the Directorate of Economics and Statistics, Ministry of Agriculture, Government of India, in six typical regions of the country, viz. Bombay, Madras, Punjab, Uttar Pradesh and West Bengal in 1954-55 and Madhya Pradesh in 1955-56. In each of the six regions two contiguous districts were selected for study in such a way that they represented the most important typical soil in the State concerned. These six regions taken together represent the major cropping pattern of the country. Sixteen villages were selected in each district. The data collected by the cost accounting and survey methods from five of these regions do not bear out the contention that large holdings are more productive than small holdings. The data rather indicate a different trend, *viz*, output per acre on small holdings is generally higher than on large holdings.

The following table is taken from the report[1] relating to Uttar Pradesh where districts of Meerut and Muzaffarnagar had been selected for study—

TABLE XIV

Value of Output Per Acre in Rupees

Size-Group (acres)	Cost Accounting Sample		Survey Sample	
	No. of holdings	Output	No. of holdings	Output
Below 5 ...	47	313.51	121	338.62
5 to 10 ...	71	300.56	133	280.91
10 to 15 ...	37	253.84	72	255.31
15 to 20 ...	17	238.90	40	252.54
20 and above ...	21	252.12	31	236.70

* Vide Shri M. R. Masani's speech in the Lok Sabha on April 14, 1959.

1 *Studies in Economics of Farm Management in Uttar Pradesh*, (1957), p. 51.

One cannot end up this array of data in favour of small holdings better than by referring to the achievements of Shri Shrikant Apte, a worker of the Bhoodan movement in our country. He has achieved on a quarter acre of land—his farm is at Rander, three miles from Surat—results which stagger one's imagination. He has experimented with what he calls *Rishi Kheti*, which is a miracle of self-sufficiency from beginning to end.

> He cultivates his plot in such a way as to get all his necessaries of life from it—food and cloth—and makes an annual saving of Rs. 400. He works on his land at an average of four hours a day with hand tools (no bullocks), fetches water on head to irrigate it from the river a mile and a half away. The only manure he uses is provided by his own excreta and the droppings of his two goats, whose fodder is procured by a circular pruning of the hedge round the farm. It takes six weeks to go round the hedge to get forage for the goats and by the time the circle is completed the hedge is ready for the next cycle of pruning.
>
> Shrikant Apte has worked his farm with complete success in this manner for the last five years. And as if not to be outpaced by the produce of the modern farm managers, using new-fangled techniques and synthetic fertilisers, he has contrived to raise prize-size vegetables at his farm. Ever seen a carrot 4 inches less than 3 feet long? If not, go to Apte's farm at Rander. Not only gargantuan carrots but you will also see mammoth *moolies* (weighing 5 lbs. each) and onions as big as ostrich eggs, weighing 1 lb. each.
>
> Cotton is Apte's cash crop. He grows only 20 plants which yield him between 1½ and 1¾ maunds of cotton. His personal requirements are met by about 10 seers; the rest he sells, just as he sells the surplus produce of vegetables. That is how he makes his extra Rs. 400 a year with which he runs a *Balmandir* and a library in the village.
>
> Shrikant Apte works on his farm only for nine months in a year. Acharya Vinoba has asked him to propagate his technique, which, Apte claims, is 'possible for everybody.' It has been described by Acharya Vinoba as 'an introduction to the practical book of Bhoodan'.[1]

This may be an extreme case, but it shows what man is capable of, unaided by machinery and artificial fertilisers.

The report of the Krishnappa Delegation to China contains on pages 92 to 104 several tables showing acreages and production in China during the period 1949-1955. Two of these on pages 100-101 show the per-acre yield of major agricultural crops, and one may argue that the gradual increase from year to year mentioned therein is indicative of the correspondence between larger farming units brought about by the introduction of co-operative farming and higher output. In China the co-operative movement took shape in 1951

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[1] *Hindustan Times*, New Delhi, dated January 29, 1957.

and it recorded its high water-mark in 1955. Between 1952 and 1954 the increases, if any, are insignificant, and it is unthinkable that the large operational unit of 1955 should have produced such immediate effects as are reflected in the significant increase between 1954 and 1955. Whatever increases have taken place must, therefore, be ascribed to the financial and technical assistance so largely extended by the Chinese Government to its farmers. Quite apart from these considerations, judged even from the standards of a statistically backward country like India, the Chinese figures are utterly unreliable. In respect both of area and yield, they are based merely on visual estimation and are, therefore, entirely subjective, in contra-distinction to the figures in the tables quoted earlier in this sub-chapter, which have been compiled on the basis of objective methods. In China, there is no counterpart to our *patwari;* there are no scientific measurements; there are no cadastral maps; there are no crop-cutting experiments.[1]

Our estimate of Chinese statistics is abundantly re-inforced by the following observations made by the Krishnappa Delegation in its report:

> By and large, it appears to us that Chinese data after 1952 are not strictly comparable with earlier data. As such, a part of the improvement that is revealed by figures of area and yield of agricultural crops in China after 1952 over those of earlier years may be considered to be statistical. (p. 86.)
>
> In China, although some village maps were prepared during the land reforms, these were very rough sketch maps only and were not used for statistical purposes. (p. 86.)
>
> Since in China, the objective method of crop-cutting sample surveys is not followed for estimating the yield of agricultural crops, especially of food crops, and since during the last few years there has been a vigorous campaign at all levels for increasing the yield and a spirit of competition is being fostered between different villages and different farmers, it may not be unreasonable to presume that the tendency towards psychological bias which we have observed in India should also manifest itself in China to some extent. When the peasants and members of the co-operative farms, local agricultural officials as also local party members are told that yield of crops must be increased from year to year and that their work will be judged by their record in this regard and when there is a natural enthusiasm in the whole country-side for increasing yields and also outdoing others, it will be only human if instead of understating the yield they tend to overstate it. (pp. 86-87).

[1] The sample surveys carried out by Prof. John Lossing Buck in 1921-25 on 2,866 farms in 17 localities of 7 provinces embodied in *Chinese Farm Economy*, (University of Nanking, 1930) and in 1929-33 on 16,786 farms in 168 localities and 38,256 farm families in 22 provinces, embodied in *Land Utilisation in China*, (University of Chicago, 1937), are, perhaps, the only examples in China of scientific statistics.

> But the important point to find out is how far the yield per acre is improving year by year as a result of various measures undertaken in India and in China. Here, unfortunately the statistics are not strictly comparable because while in India the figures of yield of foodgrains are at present largely based on crop-cutting sample surveys subject to no psychological bias, in China they are determined by subjective valuation which must be quite appreciably influenced by the psychological climate prevailing there. (pp. 87-88).

In the light of definite factual evidence given in this sub-chapter, we have to consider or reconsider in all seriousness whether the plans and attempts at agricultural reorganisation in our country with a view to increasing the size of the farming units, are not misconceived.

It is sometimes difficult to follow the logic of the advocates of agricultural producers' co-operatives when some of them are at the same time found pleading for a ceiling being put on the existing large, private holdings. They argue that the size of the farm has no bearing on production per acre and their breaking up and distribution in small units will not lead to decrease in total production. The latter view is certainly correct. But an upholder of this view cannot consistently advocate establishment of producers' co-operatives, which will be large units, with a view to increasing production. The two views are mutually contradictory.

(iii) Maintenance of Soil Fertility

In order that the soil of the country may continue to produce food sufficient to feed our increasing population, we need a farming system which will not only maintain but improve the fertility of the soil. It is submitted that a system of small farms alone can do this. As has been shown in a previous sub-chapter, a family or subsistence farm will have more organic manure at its disposal than a large farm, which will, in all probability, be mechanised and will consequently resort to inorganic fertilisers. And inorganic fertilisers are not an unmixed blessing. We will here refer to two long-term experiments on the effects of the two kinds of fertilisers.

An experiment to determine (i) the relative utility of the three major nutrients, nitrogen, phosphorus and potash, in the manuring of sugarcane, and (ii) the effects on soil fertility due to continuous application of artificial fertilisers, without being supplemented by organic or green manuring, was started in Uttar Pradesh at Shahjahanpur Sugarcane Research Station in 1935-36.

The trial is being conducted in two adjacent fields in alternate years, so that a crop of sugarcane would be available every year, the rotation followed being cane-fallow-cane.

The treatments applied to the cane crop included all the 27 combinations of (i) 3 levels of nitrogen, namely, 0,100 and 200 lbs. N per acre; (ii) 3 levels of phosphate, namely 0,75 and 150 lbs. P_2O_5 per acre, and (iii) 3 levels of potash, namely, 0,75 and 150 lb. K_2O per acre. Nitrogen was applied in the form of ammonium sulphate, P_2O_5 as superphosphate and K_2O as sulphate of potash. The lay-out adopted for the experiment is of the split-plot design with main plots to the three levels of nitrogen and the sub-plots to the 9 combinations of phosphate and potash levels, with 4 replications, thus making a total of 108 plots in each field. The gross plot size was about 1/25 acre each and the total area occupied by the trial each year has been about 5 acres. The scheme of randomisation adopted in the first year of the trial in each field has been maintained unaltered, so that the yields in successive years represent the treatment effect of the year plus the cumulative effects of the previous applications of the fertilisers.

The trial has now completed a period of 21 years with 11 crops of sugarcane in one field and 10 crops in the other. After the first 2 or 3 crops the average yields in both the fields began to show a more or less continuous fall showing thereby a marked deterioration in soil fertility. The rotation was accordingly changed in 1952-53 by introducing *sanai* green manuring before cane. Two crops of sugarcane have now been taken from each field after the introduction of green manuring. The results of this experiment are given in table XV.

It will be seen that in both the fields, till the introduction of green manuring, there was a marked deterioration in the average cane yields with the progress of years. The over-all average cane yield fell from about 690 mds. per acre to about 325 mds. during the period of 17 years. With the introduction of green manuring the improvement in soil fertility became quite marked as shown by the shooting up of the cane yields in both the experimental fields.

The salient conclusions, according to Dr. R. K. Tandon, the Director of the Research Station, are—

(i) There is a definite fall in the average yields of both nitrogen-manured and unmanured plots. Phosphate and potash applications have not shown any response. The mean values for the over-all average fall in yield are:—

TABLE XV

Mean Yield of Main Effects N. P.K. *in mds. per acre*

Year	Nitrogen			Phosphate			Potash		
	0 lb. N. per acre	100 lb. N. per acre	200 lb. N. per acre	0 lb. P_2O_5 per acre	75 lb. P_2O_5 per acre	150 lb. P_2O_5 per acre	0 lb. K_2O per acre	75 lb. K_2O per acre	150 lb. K_2O per acre
FIELD I									
1935–36	559	887	852	769	758	776	778	763	763
1937–38	357	794	802	641	652	629	647	642	664
1939–40	564	910	898	784	797	791	784	792	797
1941–42	253	627	728	552	512	543	542	531	535
1943–44	396	662	678	568	580	588	584	569	589
1945–46	394	587	595	504	512	510	513	494	520
1947–48	376	462	515	447	445	461	453	447	452
1949–50	219	437	467	354	375	394	387	372	363
1951–52	109	266	341	239	243	235	244	238	234
1953–54*	434	708	718	611	626	624	612	609	630
1955–56*	523	798	817	709	714	714	710	715	712
FIELD II									
1936–37	388	651	795	602	620	613	603	613	619
1938–39	561	832	884	755	761	761	751	758	767
1940–41	389	520	539	490	478	480	486	470	491
1942–43	466	937	1035	822	814	823	814	816	828
1944–45	429	727	785	629	648	663	646	646	648
1946–47	301	551	512	412	418	435	410	426	427
1948–49	289	515	545	441	453	456	445	450	454
1950–51	276	432	531	393	417	429	399	408	432
1952–53*	429	650	703	492	589	601	585	607	590
1954–55*	432	790	850	682	686	708	686	688	698

*After green manuring.

	Mds. per acre per crop.
Control (No nitrogen)	30.24
100 lb. N per acre	55.54
200 lb. N per acre	52.75

(ii) Continuous application of sulphate of ammonia without any organic or green manuring has resulted, on the average, in an additional deterioration (as compared with no manure) to the extent of about 25 maunds of cane per acre;

(iii) For sustained high yields over long periods artificials only cannot be depended upon; a proper balance between the organic manures and inorganic (artificial) fertilisers is indicated as a permanent policy for obtaining good yields over long periods.

The famous Rothamsted experiment in regard to the effect of organic and inorganic fertilisers on the production of wheat has thus been described by T. B. Wood*:—

> Perhaps, the most famous field at Rothamsted is the Broadbalk Field on which wheat has been grown every year since 1852. This field is divided into nineteen plots, each plot being half or quarter of an acre. The plots are manured differently, but each plot gets the same manure year after year. One plot has been continuously unmanured since 1852. From 1852 to 1861 its average yield was 16 bushels per acre. From 1892 to 1901 it yielded on the average just over 12 bushels per acre. In fifty years, therefore, the productivity of this plot for wheat has only decreased by less than 4 bushels. Wheat is, therefore, a good forager, no doubt in virtue of its deep and extensive root system. The average yield of the unmanured plot over the whole 50 years is 13 bushels per acre.
>
> The average yield of the plot manured every year with mineral manures, i.e. phosphates, potash, and lime is only 15 bushels per acre, from which we may conclude that wheat is not specially benefited by these manures. The plot manured annually with sulphate of ammonia has given an average yield of 21 bushels per acre, which shows that wheat is specially helped by nitrogenous manures.
>
> It is not, however, entirely independent of phosphates and potash, for on the plot which received annually sulphate of ammonia, together with phosphates and potash, the average yield has been 31 bushels per acre, an increase of 10 bushels over the yield of the plot receiving nitrogen only.
>
> The best yield is given by farmyard manure—36 bushels per acre on the average of 50 years or 5 bushels more than the plot receiving a complete mixture of artificial manures. This increase is, perhaps, due to the improvement in the physical condition of the soil by the humus† resulting from the farmyard manure. (p. 172)

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* *The Chemistry of Crop Production* by T. B. Wood, University Tutorial Press Ltd., London, 1920.

† *Humus* literally means soil or earth, but in practice it is used to indicate that decaying and undecayed residue of vegetable and animal waste lying on the surface, combined with the dead bodies of bacteria and fungi when they have done their work—the whole being a highly complex and somewhat varying substance—which

Every manure, which disturbs life in the soil and drives away the earth worms and bacteria or other humus-making organisms, makes the soil more lifeless and more incapable of supporting plant life. The dangers of one-sided fertilising are, therefore, obvious especially when one uses strong doses of chemical fertilisers containing soluble salts like potassium or ammonium sulphates, or highly corrosive substances, such as nitro-phosphates (usually under some fancy trade name), or poisonous sprays, such as arsenic and lead preparations. These injure and destroy the micro-organic world. Soils intensively treated with chemical fertilisers or orchards sprayed for a long time with chemicals have no longer any biological activity.

Further, all crop—increases from chemicals are short-term benefits. Plants raised by these means are much more liable to pest and disease attacks, the natural laws of growth having been violated and disturbed. Plant disease will cure itself when plants are raised on humus manures.

The great English agriculturist, the late Sir Albert Howard,[1] a former Director of Agricultural Research at Pusa, says of artificial fertilisers:

> The feature of the manuring of the West is the use of artificial manures. The factories engaged during the Great War in the fixation of atmospheric nitrogen for the manufacture of explosives had to find other markets, the use of nitrogenous fertilisers in agriculture increased, until today the majority of farmers and market gardeners base their manurial programme on the cheapest forms of nitrogen (N), phosphorous (P), and potassium (K) on the market. What may be conveniently described as the N. P. K. mentality dominates farming alike in the experimental stations and the countryside. Vested interests, entrenched in time of national emergency, have gained a strangle-hold. Artificial manures involve less labour and less trouble than farmyard manure. The tractor is superior to the horse in power and in speed of work; it needs no food and no expensive care during its long hours of rest. These two agencies have made it easier to run a farm. A satisfactory profit and loss account has been obtained. For the moment farming has been made to pay. But there is another side to this picture. These chemicals and these machines can do nothing to keep the soil in good heart. By their use the processes of growth can never be balanced by the processes of decay. All that they can accomplish is the transfer of the soil's capital to current account. That this is so will be much clearer when the attempts now being made to farm without any animals at all march to their inevitable failure. Diseases are on the increase. With the spread of artificial fertilisers and the exhaustion of the original supplies of humus, carried by every fertile

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is, so to say, the mine or store or bank wherefrom the organisms of the soil and then the plants or the trees draw what they need for their substance.

[1] *An Agricultural Testament*, Albert Howard, New York, 1943.

soil, there has been a corresponding increase in the diseases of crops and of the animals which feed on them.

Howard calls attention to the contrast between western farming methods and the processes that nature uses to keep the soil in living, healthy condition:

> What are the main principles underlying nature's agriculture? These can most easily be seen in operation in our woods and forests. Mixed farming is the rule; plants are always found with animals; many species of plants and animals all live together. In the forest every form of animal life, from mammals to the simplest invertebrates, occurs. The vegetable kingdom exhibits a similar range: there is never any attempt at monoculture: mixed crops and mixed farming are the rule....

And Howard insists:

> The main characteristic of Nature's farming can, therefore, be summed up in a few words. Mother Earth never attempts to farm without livestock; she always raises mixed crops; great pains are taken to preserve the soil and to prevent erosion; the mixed vegetable and animal wastes are converted into humus; there is no waste; the processes of growth and the processes of decay balance one another; ample provision is made to maintain large reserves of fertility; the greatest care is taken to store the rainfall; both plants and animals are left to protect themselves against disease.

Even those who are in favour of chemical or mineral fertilisers advocate that they should be used in combination with some or other suitable means of humus maintenance, and farmyard manure is admittedly the best. So that a large farmer to the extent he uses machinery and lags behind the small farmer in the maintenance of cattle, will generally lag behind in the maintenance of soil fertility and, therefore, ultimately in the yield per acre. Green manure could, as the Shahjahanpur experiment has shown, be a substitute for farmyard manure to a large extent. The cultivation of leguminous and other nitrogen-fixing crops would, therefore, have to be promoted where the supply of farmyard manure is reduced by mechanisation. But this would prevent land from being utilised for cash or more productive crops.

There is a cycle in nature which a small farmer can help best complete: if this cycle is broken nature takes its revenge in returning smaller yields.

The task of agriculture is to transform solar energy into chemical energy stored up in human food. This transformation can be brought about only through the agency of living organisms. Green plants, and particularly, cultivated crops, constitute the best and most efficient among such agencies—the first basis of agriculture.

But only one-quarter of the material of which the crop is composed, occurs in a form suitable as human food. Three-fourths of

the produce of plants occurs in the form of residues such as straw, chaff, roots, etc., which cannot serve as human food and other purposes of human consumption. Nature has, however, so ordained that these residues can serve as animal food, instead. Not only that: the animals can convert this straw and chaff into other forms of organic matter fit for human consumption. But, as in the case of crops, animals too, on their part, can make available only a quarter of the energy they consume, as products which human beings can use. The rest goes into waste material. The excreta contain all the mineral plant nutrients taken in by the animal in its food, and need to be decomposed and the nutrients re-converted into forms available to plants. This decomposed farmyard waste is usually known by the name 'compost'. The mineral nutrients originally derived from the plants have to be dug in or ploughed back in the form of compost into the soil which will make the nutrients again available to the plants. It is thus that nature's nutritional cycle becomes complete. It is thus, *viz.* by ensuring the return to the soil of organic wastes for regeneration by bacteria, worms, etc., that the fertility of the soil will be maintained.

If, therefore, we are to raise the productivity of the soil, we must make live-stock an indispensable element of agricultural economy. Live-stock—another living machine—is the second indispensable basis of agricultural industry. A large farmer can obviously keep a large herd but the very much greater overhead charges of its upkeep and insufficiency, if not actual lack, of personal attention required by every individual cattle will make the herd uneconomic. He cannot, therefore, ensure the return of all the organic wastes, which may be primarily derived from his farm, to the latter and cannot, therefore, aid nature in completing the nutritional cycle.

Speaking at the Lucknow University on the researches carried out in India and specially with which he had been associated from 1930 onwards, Dr. N. R. Dhar, Director of Sheila Dhar Institute of Soil Chemistry, Allahabad, said on December 17, 1956 that "Cow-dung used by our ancestors from time immemorial was the best manure suitable to our soil. Next to it were organic plants such as weeds and legumes, etc., which liberated a large quantity of energy due either to bacterial decomposition or photo-chemical oxidation. These not only increased the production of crops but also enriched the nitrogen content of the soil".

"Haber's method", he went on to say, "which was used at Sindri and other places in this country, for the synthesis of ammonia and its subsequent conversion to ammonium sulphate, had some inherent difficulties. The soil of India and other eastern countries was more

alkaline and so it could not absorb ammonia properly. Though this method gave a good production of crops, it reduced the nitrogen content of the soil—an injurious thing for the soil".[1]

The role of peasant or small-scale farming in maintaining soil fertility has been very forcefully put by David Mitrany in his book, *Marx Against the Peasant* (London, 1952):—

> Besides, perhaps the most important aspect of the matter had almost been lost sight of in the debate about production quantities, namely, the vital need of maintaining the productivity of the soil. That is a need which concerns every country, but not till the shock caused by some disaster, like that in the 'dust bowl' of the western United States, had it received the attention which it merits. Good farming means not only what is got out of the soil but also what is put back into it, to keep it 'in good heart and condition'. Everywhere and at all times experience seems to have shown the same close relation between large-scale farming, especially under tenancy, and the impoverishment of the soil. Even in the United States the policy is now to break up the old cotton lands of the South into small units for mixed subsistence farming, as the best way of redeeming the soil (as well as the health and self-respect of the eight million whites and negro share-croppers) exhausted by the endless raising of the profitable commercial crops. The planter and large tenant often treated the land as an investment, to be used as long as it paid and sold as scrap: 'land is with him a perishable or movable property'. Marx, characteristically, had simply laid it down that small-scale cultivation impoverished and exhausted the soil. Yet how could a peasant, who expects to raise generations on the same bit of ground, treat his land otherwise than as a living thing? The virtue of ancient and recent peasant farming, wrote a reviewer in the scientific journal, *Nature*, is that it returns to the soil the elements of life.
>
> There is a strong element of ideal truth in the old Socialist argument that being God-given, and needed by all, the land should be no man's private property. Yet the land as such would be of little worth unless its bearing powers are perpetuated. It is the function of the land, not its raw substance, that society must possess for well-being and survival and in that sense the claim to individual ownership may be logically rooted in the nature of agricultural production itself. With the factory worker, even the artisan, the quality of his product depends on the quality of the material and on his own skill. Whatever tools or machinery he uses are a passive factor, taken over as they stand from the previous user and passed on to the next, but little affected by their temporary use, or easily replaced. All the variable factors of production, materials and skill, are wholly absorbed in each object produced, while machines and tools are transient. With the farmer or peasant, the matter is very different. His chief tool is the soil itself, or rather it is partly tool, partly raw material, a unique combination in the whole scheme of production. It is unique in that it is both a variable factor, affected

[1] *The Pioneer*, Lucknow, dated December 19, 1956, p. 3.

> by each period of use, and at the same time a constant factor, which cannot be replaced. What the farmer can get out of it depends greatly on the state in which the soil was passed on to him by the previous user, and his own way of treating it will affect the results obtained by the next user. Neglect of the soil by one may make it of little use for many. Quite apart from immediate benefits, therefore, the very nature and spirit of cultivation seem to require that the man who tills the land should have constant use of the same piece of the same instrument (pp. 128-129).

Only when the farmer has the same regard for his soil that he has for his bullocks, the welfare of which he guards daily, can we expect of it a performance commensurate with its capacities, year in and year out, without detriment to it. To the peasant, and, let us be clear in our minds, human nature being what it is, not to a member of a co-operative or collective farm, such care and regard are a matter of his own survival.

The few inches of top soil are the most prolific and universal source of wealth that mankind possesses. Large-scale technology which goes with big farms is, however, busy destroying this wealth. It takes nature, in the most favourable circumstances, from 500 to 1,000 years to make one inch of top soil. But today man, due to his indiscreet use of land, is turning vast areas of fertile into deserts in much less than a generation, by helping causes of erosion. Modern large-scale farming using chemical fertilisers on a scale without precedent in the history of agriculture, has been most successfully developed commercially in America, but it is there that soil erosion has also proved most widespread and disastrous. The one-crop grain and cotton regions in the USA undoubtedly show a much larger decline in fertility than livestock districts. One hundred million acres of land have already been exhausted in the USA in less than two centuries of cultivation. On the other hand, there is Chinese agriculture based on the use of natural manures, which has endured for 40 centuries without any demonstrable exhaustion of soil fertility. The lesson is clear: only by faithfully returning to the soil, in due course, everything that has come from it, can fertility be made permanent and the earth be made to yield a genuine increase. The only way to preserve soil structure is to add humus —and the most feasible way to obtain humus is through the composted farmyard manure.

The small cultivator has, to repeat, a positive contribution to make in this regard. He depends entirely on his animals and himself for all agricultural operations, works up his land well, has a valuable source of organic manure in his farm and animal wastes, keeps his land covered with some crops or other, and, above all, takes care of his land like a precious treasure, for that means life

for him and his family and dependants. In mechanised cultivation, which means replacement of animal and human power by machines, a valuable source of organic matter is lost and, with that, starts the whole series of troubles for the land, animals and human beings. Chemical fertilisers then find increasing use and give rise, in turn, to a number of plant maladies. In spite of insecticides and pesticides, the fact remains that diseases multiply unabated and the vicious circle spreads.

(iv) Co-operative Farming unnecessary

Protagonists of large-scale farming—and a co-operative farm is a large-scale farm—contend that it has several advantages over small-scale farming, which will lead to increased production. Firstly, technologies can be used, or scientific cultivation is possible, on big farms alone. According to our Prime Minister, "the argument for co-operative farming is based on the very small holdings that farmers have. In countries where holdings may be twenty or thirty acres or more, this may not be necessary. But, where the holding is one or two acres, it is not possible to use many modern methods. (I am not referring to tractors for the present) and our technique of farming will not improve. It is only when we employ better techniques that we can improve our yield." Secondly, water, credit and marketing and technological facilities, which go to swell the produce and income of a farmer, are easily available to large farms rather than to small farms. Thirdly, large farms alone possess the financial resources required for effecting land improvements or reclamation of land that may be lying waste. Fourthly, planned crop rotation and a rational use of land, which will increase the double-cropped area and the area under high-yield crops, is possible only on big farms. Fifthly, more than one wasteful operation necessitated by small size of peasant farms will be eliminated, costs reduced and capital resources which are so scarce but are wasted on these tiny farms conserved. Sixthly, large-scale or co-operative farming provides the only remedy of fragmentation and of small uneconomic holdings in the country which are likely to go on increasing with the growth of population. It is said that these holdings are characterised by 'lack of capital resources, low level of technique and productivity, and under-employment'.

Finally, as a result of increased food production, co-operative farms will have a surplus which can be marketed to feed the towns, thus obviating food imports. This surplus, which is not available on peasant farms today, or, if available in some degrees, is not cap-

able of mobilisation, will provide the necessary capital for rapid economic development of the country.

Now to take the arguments one by one. What do we understand by technologies in agriculture? They are of three kinds according to James Maddox:

> One group of agricultural technologies springs from the biological sciences. Illustrations are the high-producing, scientifically-bred varieties of plants and animals, including, of course, various types of hybrids. Also, there is a group of vaccines for the prevention and cure of livestock and poultry diseases which are basically biological in nature.
>
> A second group is what may be called the chemical type of agricultural technologies, because it springs largely from the work of the chemist. Examples of it are the ordinary commercial fertilisers so commonly used in many countries, a large and important list of insecticides and fungicides, and also weed-killers. Still another example is some of the modern supplements to livestock rations.
>
> A third group of agricultural technologies springs from the work of the physicists and the engineers. Examples are tractors, the many complicated farm machines and equipment that go with power farming, and also a long list of other things such as farm buildings, silos, and storage facilities, and even farm-to-market roads, and marketing facilities. All these are basically engineering structures or designs.[1]

Now, as regards the first and the second group, they do not need a large farm to use them. They are being used in the fullest measure on one and two-acre farms of Japan. The responsibility for development of scientifically-bred varieties of plants and animals, preparation of vaccines, and discovery of fertilisers, insecticides and fungicides, shall, of course, have to be shouldered, as all the world over, by the State. Research takes generations and colossal sums of money, and cannot be the responsibility of individuals.

As regards the third group, *i.e.* tractors and other large machinery, etc., it is true that they cannot be used, or are unnecessary on small farms. But at the same time it is also true that these technologies do not increase production per acre that we in India are concerned with.

It may be stated here that use of machinery in agriculture is also called a higher or improved technique as distinguished from bullock-farming which is characterised as a low technique. These erroneous designations have done much to create a bias in favour of the former and against the latter. The Prime Minister may not want tractors 'for the present', but to many people modern farming implies mechanisation and, when co-operative farming is advo-

[1] A paper entitled *Transferring Agricultural Technology from Developed to Under-developed Areas* read at the International Conference on Land Tenures and Related Problems in World Agriculture, held at Madison, Wisconsin, U.S.A., 1951, Report, p. 343.

cated, it is often due to the wrong assumption that great progress automatically follows mechanisation. There are, however, numerous examples where very intensive and modern forms of agriculture have been developed and high production achieved without mechanisation or, at least, a high degree of mechanisation.

That mechanisation is also advocated because it will serve as a chain which will bind the peasant to the co-operative farm once he enters it, will be clear from the remarks of the Indian Delegation on Agricultural Co-operation, known as the Patil Delegation, which went out to China in 1956 :—

> When cultivation is done through machines, the sharing of the common instruments of production could be a cementing factor. In the measure that a co-operative can become mechanised the tendency to revert back may be less. (Delegation Report, p. 147)

Perhaps, comment on such an approach is unnecessary. It is known that mechanisation has greatly helped communist control of Russian agriculture.

We have already seen that in agriculture it is not machinery that produces the commodity but the soil. Had machinery by itself contributed to agricultural production, the yield per unit of land in the United States of America, where the chief means employed in working the farm is the use of large machinery, would have been greater than that in Western Europe where much less machinery is used, and in Japan where land is worked for the most part by human labour. But we find that the reverse is the case. Japan mostly invests labour; United States capital. That the production per unit of labour in the United States is several times greater than in Japan is beside the point. That mechanisation of farming operations does improve considerably the yield per unit of labour is admitted; but it does not increase the yield per unit of land and it is this that matters and is in dispute. The USA is able to export agricultural produce not owing to high production per acre, but to her vast total acreage.

That the introduction of mechanised agriculture or cultivation by means of tractors does not lead to any increase in per-acre yield is, perhaps, now admitted by our experts also. Following are the results obtained from some cultural experiments conducted by the Indian Agriculture Research Institute—

In tropical regions or regions of heavy rainfall like India, tractor-ploughing will otherwise prove a curse. "Steel mould-board plows, says Richard B. Gregg, "which turn over the soil expose too much of the soil to the hot tropical sun, thus killing too many of the soil bacteria and other microscopic lives on which the life and health of the vegetation depend. It is no mere coincidence that soil erosion

TABLE XVI

	TYPE OF PLOUGHING	MEAN YIELD IN MDS. PER ACRE (sugarcane)
C0	*Desi* ploughing by bullock power	409.9
C1	Tractor ploughing upto 6 inches followed by twice discing and twice grubbing	361.5
C2	Tractor ploughing upto 10 inches followed by twice discing and twice grubbing	356.2

in America has advanced with the increase of technology in farming. Methods that are continuously effective in temperate climates with moderate precipitation distributed evenly throughout the year are dangerous if applied to tropical lands with monsoon rainfall. Even European methods applied indiscriminately to American conditions did much injury to the soil."[1]

Mechanised cultivation is found suitable only in the conditions of the Russian steppes or prairies and in such other regions where the climate is cold or temperate and there is little or no rainfall, or where, as in Western Europe,[2] the land receives the rainfall distributed in the form of showers all over the year, but not in the conditions of our country which has a tropical or sub-tropical climate and large parts of which receive torrential rainfall during a short period. The nitrogen and organic carbon contents of our soil are already low and the layer of the humus thin. Mechanisation of agriculture, particularly, of tilling, will lead to erosion and further depletion of our soil. The fine humus structure of the soil cannot be produced or preserved by machines; they will rather destroy the real creators of natural humus. The soil being an assemblage of living organisms and living creatures—creators of humus—cannot be successfully managed by machines and mechanical processes. Tractors and machinery in our country, therefore, may with advantage be employed only in the eradication of deep-rooted weeds like *kans*, *hirankhuri* and *motha*, in opening up and colonisation of new areas, *i.e.* in bringing cultivable, but hitherto uncultivated, waste land under cultivation, or, in clearing land originally under jungle.

The argument that ploughing with mechanical power is more economical than ploughing with animal power is supported neither

[1] *Which Way Lies Hope?*, Navjivan Press, Ahmedabad, 1952.
[2] It is understood that now under the action of farm tractors soil erosion is appearing in France and Western Germany also.

by logic nor by experience. According to document no. 5 (pp. 19-20), published by the 'European Conference on Rural Life, 1939'—"While, in the case of tractors, variable costs are high and fixed costs low, in that of draught animals the variable costs are trifling and fixed costs are considerable. In other words, the tractors, though expensive when in actual operation, cost little when idle, while the cost of keeping draught animals, though scarcely higher when they are at work than when they are resting, is continuous since they have to be fed and cared for, whether working or not. Hence the use of tractors is most profitable when a great deal of work has to be done in a short time. Animals, on the other hand, are more economical when the work is divided fairly evenly over the entire year".

Inasmuch as laid-up tractors do not eat, they are worth while only when the work is intermittent. They are not profitable for the usual run of agricultural work. In our country where steady and constant work on land throughout the year is generally available, the use of bullocks for traction purposes is not uneconomical as compared with that of machinery. In fact, the bullock in our conditions is far beyond the reach of tractor competition.

The working costs of animal traction are comparatively low also because tractors do not repair their injuries as animals do. Breakdowns of machinery are inevitable and there will be need for repairs. In America every village and town has a repair garage with spare parts. It is not so in India. If we maintain a Machine and Tractor Station at every co-operative farm or even at more than one, the expenses will more than absorb the economy, if there is any, that pooling of land and labour resources may possibly bring about. Spare parts and repairs are available to farmers today only from the big cities, which means delay of several days and consequent crop losses. Nor, as has already been pointed out, do the tractors produce any kind of manure like animal dung, which is an important means of soil maintenance and improvement.

Yugoslavia found by actual experience before the last Great War that purchase of large machines (specially of tractors) and their maintenance was too expensive even on a co-operative village basis, particularly when working animals were adequate for the purpose and human labour, as here in our country, was so plentiful. We believe the experience of owners of the few mechanised farms that exist in India, is also none too different. In our country, mechanisation is likely to prove more expensive than in the USA or the USSR because, at least, for some time to come, petrol and the machines will have to be imported from abroad. In the USA the cost of kerosene and lubricants represents 42 per cent of the entire cost

of tractor work. In India, which is distant from the sources of supply, these costs will be about 25 per cent higher, *viz.* 52 per cent, owing to transport and tariffs.

The Chinese experience is similar. A conversation between Prime Minister Chou-En-lai and the Krishnappa Delegation, which visited China in July-August, 1956, has been reported thus: "Mr. Chou-En-lai went on to say that the heavy pressure of population in China meant that the development of agriculture, at least, for the present could not be based either on mechanisation or on large-scale reclamation. In China, the cost of production in mechanised farms might well prove to be higher than the cost of production in non-mechanised farms where farmers worked with ordinary farm implements. The reason was that labour was still much cheaper in China. These big state-owned mechanised farms when set up even with gift tractors were not, therefore, unmixed blessings. They were causing the state quite a lot of expenditure" (Pp. 23-24 of the Report).

Professor John Lossing Buck in *Chinese Farm Economy* (The University of Nanking, 1930, p. 315) examined the possibility of replacing present Chinese methods of cultivation by tractor farming. He found animal power definitely more economical than the use of tractors:

TABLE XVII

			Chinese Dollars
Initial cost of tractor			$ 2,300
Initial cost of two gang tractor plough			$ 300
Yearly depreciation, interest, repair and risk of the :			
(1) Tractor	$ 832		
(2) Plough	$ 77		$ 909
Cost of tractor-ploughing one hectare			
(*a*) Yearly non-recurring expenses	$ 4.75		
(*b*) Operating costs :			$ 10.43
(i) Kerosene ... 3.78			
(ii) Lubricating oil 1.40	$ 5.68		
(iii) Labour ... 0.50			
Whereas cost of ploughing one hectare with a water buffalo came approximately only to			$ 4.00

It is reported that in the reclamation works after the Yangtse flood in China in 1947, bullocks and wheel-barrows were found to be cheaper than bulldozers (and the bullocks were later used as draught animals on the re-established farms).

Leonard E. Hubbard, an impartial writer on Russian agriculture, writing of the comparative costs of animal and mechanical power, observes :

> The apotheosis of the machine leads to its use out of season as well as in season. It was the experience of the German farm concession (the celebrated Drusag which until 1932 farmed some 27,000 acres on the Kuban) that ploughing with animal power was often more economical than ploughing with mechanical power. Animals (they use oxen a lot in the North Caucasus) were very cheap to keep and wages were low; a unit consisting of eight yoke, a four-furrow plough and two men, or a man and a boy, to guide the leading yoke, ploughed a hectare as efficiently and at a smaller total cost than a tractor. The latter, of course, came into its own when speed was a factor; for instance, when autumn rain made the soil just right for sowing winter grain. The Russian, however, is inclined to think that, because the tractor turns over the soil at a prodigious rate and with lots of cheerful noise and bustle, it is doing it more economically and efficiently than any other method. In 1935 the official standard consumption of tractor fuel in spring ploughing one hectare was 21.6 kilos (vide the article *The Production Cost of Grain in State Farms in Planned Economy* No. 2, 1937), and in 1934 the price of one litre of benzine was about equal to the price of 10 kilos of grain. 21 kilos of benzine would be about 23 litres (one litre of water weighs 1 kilogramme, and the specific gravity of benzine is approximately 0.90), equal in cost to 230 kilos of grain. The quantity of corn and hay consumed by horses during the process of ploughing one hectare could not be more than the equivalent of 30 kilos of oats. According to the same authority, the total consumption of fuel in producing and, presumably, harvesting and threshing one hectare of spring wheat in 1933 was 57.3 kilos, equal in cost to 63 litres, or 630 kilos of grain or very nearly the whole crop .....If these figures are correct, it is no wonder that the state farms were being run at a loss.[1]

Further, we must remember that it is in the USA, Canada, Australia and the USSR alone that mechanisation is synonymous with the big tractor and harvester-thresher, or that mechanised farming means large-scale farming. In the first three countries an average farmer has a large arable area on which large agricultural machinery can be used. Now, a small holder meets difficulties in utilising large farm machinery because of the size of his holding, the fragmentation of his fields, and because he lacks the necessary capital. The Soviets solved this problem by adjusting the size of the holding to the requirements of the machine, that is, by establishing collective farms. That is one way. The other way is to adjust agricultural machinery and its utilisation to the given size of the holding, which in India, as in many other countries, is small.

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[1] *Economics of Soviet Agriculture*, 1939, Macmillan and Co. Ltd., London, pp. 260-61.

In Europe, mechanisation is increasingly taking the form of electrification of the countryside and the use of labour-saving machinery, leaving the structure of the small holding unaffected. There the manufacturers of agricultural machinery had begun to turn out, before the last war, machines suitable for use on small holdings, while possessing the advantages of large machines. "Engineers are now designing small implements, machines and tractors, suitable for peasant holdings. Some can be worked by small internal combustion engines and some by electricity; the use of both was spreading over Europe before the War and we hope will continue to do so after the War; either can work a small machine almost as economically as a large one," said Sir E. John Russell, Director of the Rothamsted Experimental Station, in a paper read in a Conference held in April, 1943. David Mitrany, the author of *The Land and the Peasant in Rumania*, had also written even before the last War, "that 3 *ha* was the smallest area on which machines and implements could be rationally used". Three hectares come approximately to 7.5 acres or 12 standard bighas only. German experience indicates that a field between 1 and 2 acres is not too small for a tractor of, say, 15 to 20 h.p. In Japan, they have devised small tractors which have 3 to 5 horse-power and can plough one acre a day. (These tractors which numbered 11,131 in 1950 throughout the country increased to 34,974 in 1953). That is, a large farm is no longer a condition precedent to the use of machinery or application of scientific knowledge.

When the holdings are too small and uneconomic for the use of bullocks, the inevitable conclusion is not to pool them so that large machinery may be used. Small holdings can be worked by manual labour as they are mostly in China and Japan, and yet, as we have already seen, scientific techniques other than large machinery employed on them. In parts of France also, where arable holding of two to five acres abound, if the field is too small for ploughing, the spade is used for tillage and the average peasant has, by his industry, converted even the most rocky lands into orchards, vineyards and corn-fields. Surely, we can also do the same: for, lest we forget, our aim is, not profit per man, but to get the best out of the land, to make it yield the maximum production per acre and at the same time to keep the largest number of people employed. In fact, certain peasant communities in our country in certain localities are already doing it. For example, in the suburbs of the towns of Uttar Pradesh, vegetable-growers, mostly belonging to the *Kachhi* caste (the best quality of land, *kachhiana*, being known after them) usually carry on cultivation on their tiny holdings of two acres or so, without the

aid of animal power, and produce far more (and derive far greater income) per acre than farmers in the interior do.

Reference has already been made to the example of a Bhoodan worker in our country, Sri Shrikant Apte, who possesses no farming machinery.

In any case co-operatives can be established for the purchase of such agricultural machinery as the farmers may need, for example, for operations where the time factor is important, such as planting and harvesting, but either which they have not the means to buy or which would not pay if used in a single small farm. Only, joint use of such machinery will necessitate co-operative cropping schemes, which can be achieved without pooling of the land into a single large unit. But as against whatever advantage large agricultural machinery may possess, we must remember that members of the co-operative would all be wanting it at the same time, which will make the co-operative unworkable.

As regards the second advantage of large-scale farming, it is true that a man of small means, particularly, if he is an uneconomic holder, cannot often afford the facilities, technological and other, that will augment his produce or income. There are, however, two other courses open.

Either, the State should provide the facilities as it is doing today in a small measure in the form of canals and tube-wells and provision of *taqavi*, fertilisers and insecticides. Or, the peasant farmers combine their resources, find these facilities for themselves, that is, shortcomings of small-scale production be mended by co-operative arrangements. In the latter case, the crucial question is —to what extent should they pool their resources? What is the right socio-organisation principle which will serve to raise the rural standard of living, and yet not rob the peasants of their liberty? Shall they pool their land and labour resources and work jointly on a large undertaking into which their holdings would have been merged, or, shall they keep their holdings intact, operate them independently and co-operate in non-farm operations alone, that is, pool their financial resources alone with a view to securing the facilities which actually go to increase the production or income of a farm, but cannot be secured by a small man on the strength of his small means ? In our opinion as we have already indicated, it is the latter type which will best suit our purpose. It is the co-operative principle, combined with the incentive of individual land use and private ownership of land, that offers the right solution.

Since an increase in the size of the farm does not lead to greater production per acre, it is unnecessary and it will be a mistake to

ask the peasant farmers to surrender their holdings, or to hustle them into doing so. Co-operation need not extend to the act of farming, to those functions of farm management which can properly be executed within the boundaries of a single small farm. Such functions should remain the object of the independent individual himself. All that peasant farmers need do by co-operative action is to save themselves from the disabilities entailed by the small size of their business and their lack of training in the ways of a commercial civilisation. The real mission of co-operation in agriculture should be to secure to the peasant all the benefits and technical advantages of a large-scale undertaking, while they still retain freedom or advantages of private property. Through it the peasants should be able to secure the same results as large-scale production without the attendant hardships which this form of production has so often brought to the worker in manufacturing industry. Co-operation is the closer union of otherwise independent units—merely coming together of scattered entities—for purposes of eliminating certain disadvantages attendant upon independent, isolated action. Were the members of the organisation to sacrifice their economic and individual independence, it would amount to a merger, not co-operation. Nor, to repeat, from the nature of the agricultural business, is a merger leading to largeness of size, a condition precedent to increased production.

In agriculture two kinds of reform are possible. One is institutional and the other technological. Transformation of peasant proprietorship into joint farming is an institutional change that will meet with resistance. At best, it will take a long time before its efficiency can be assessed. On the other hand, technical and technological improvements are easy to effect. The farmer who will resist joint farming will rather welcome the use of water, manure, improved seeds, pesticides and better farming practices in general. These can be easily used or introduced on small-sized farms. Here our model should be not China or the USSR, but Japan which produces more per acre than either of the former countries. And the secret of Japanese agriculture lies in technological improvements, not in institutional changes.

The report of a survey, *Co-operatives and Land Use* made by the Food and Agriculture Organization of the United Nations, already referred to, has this to say on the point—

> During the last half century, the rise in yields due to scientific and technological advance has been general, and has been more rapid in many countries in which individual farming is practised than in those which have gone in for massive collectivisation.

Advantages of large-scale undertakings, also called 'economies of scale', expected from co-operative or collective farming, are often referred to without necessary distinction being made between operational, commercial and financial economies. As we have already seen, in our conditions of a labour-surplus agriculture, there can be no operational economies or economies resulting from mechanisation of farm operations; at best, such economies are insignificant. It is, however, only in commercial and financial economies,—the economies of organised bulk buying and selling, and cheap credit—that large farms excel. But to achieve these 'economies of scale', no merger of holdings and obliteration of identities of the peasants is necessary; they can be achieved through service co-operatives, as they have been in several countries, while incentives remain unimpaired.

"Northern Europe", says Dr. C. R. Fay, Chairman of the Horace Plunkett Foundation, "has proved to the hilt that the highest degree of technical excellence is entirely compatible with family farming, but only on two conditions: first, that the land unit is the special subject of State guardianship and, secondly, that individual family effort on the land is supplemented by group effort in purchase, processing and sale".[1] In other words, large-scale farming is not essential, and, peasant farming as such offers no hindrance, to technical progress.

We may state here that by State guardianship is meant prohibition by law of agricultural land either from being amassed in large areas by one person, or from being divided by inheritance or sale into too small units.

The Patil Delegation, however, does not think service co-operatives can prove an effective agency for bringing advantages of a large-scale organisation to the doors of the peasants. Improvements have not been carried out or agriculture intensified in our country even on holdings exceeding 10 acres, which should provide fairly good units of cultivation. The reason, it is said, lies in the limitations inherent in family farming. Schemes of land improvement may be undertaken by a cultivator either with his own labour resources or with hired labour. No considerations of money costs (outlay) and benefit (return) are involved in undertaking the former. As regards the latter, a cultivator will take up only those which are remunerative for him. But in agriculture there are many improvements which are not sufficiently remunerative. This sets a limit to the extent to which a cultivator could go in undertaking improvements through hired labour even if he were to be provided with all the

[1] Vide *Year Book of Agricultural Co-operation*, 1943, p. 64.

supplies and finances required for the purpose. Such improvements can, therefore, be effected either by the State or by an institution organised for common action based on considerations of community's interest, rather than individual interest. A co-operative farm is eminently such an institution, so runs the third argument in its favour, which will bind together those who have got the land but not the necessary labour to work it and those who have got the labour but not the necessary land to occupy it. Such farms alone will, through undertaking land improvements and intensification of agriculture, ensure the fullest use of our available man-power, which is our greatest asset but is going waste today owing to unemployment and under-employment.

Service co-operatives, it is contended, cannot finance improvements on petty holdings—and most holdings in our country are petty —even if the improvements are remunerative. For, there is a large gap between the actual income of the petty farmers and the requirements of bare necessities of life. The additional income which may accrue from improvements initiated and financed by service-co-operatives would hardly cover a small portion of the gap. Recovery of loans from the petty farmers, therefore, presents serious difficulties.

The answer is simple. The report of the Patil Delegation gives no facts and figures to prove its assertion that even cultivators of holdings exceeding 10 acres do not undertake land improvements which may not be profitable in the economic sense. This may be true of owners of large farms to whom agriculture is a profession, but to an average cultivator in our country it is a way of life. Born as he is and living as he does in the midst of hazards, uncertainties and vicissitudes of nature, he does not reckon in the commercial way, nor does he draw up a balance-sheet of loss and profit. He makes no calculations where his land, the *Dharti Mata,* is concerned. He will sink any amount of money and labour on her improvement: this is proved by the high price which a cultivator is willing to pay for land—a price which if it is considerations of outlay and return alone that mattered, no industrialist or non-agriculturist will ever be willing to pay. Highly developed and well-kept peasant farms in central and north-western Europe, Japan and parts of India can be quoted by way of proof. The report embodying *Studies in Economics of Farm Management in Uttar Pradesh* undertaken in Meerut and Muzaffarnagar districts at the instance of Government of India in the year 1954-55, observed thus about the cultivators' love of land improvement, in the introductory chapter—"The whole of the country-side gives a look of very well-maintained and properly levelled fields.....As a result of careful cultivation soil has considerably improved. It owes its dark appearance more to its proper tillage

and manuring than to its natural characteristics (p. 1).....The noteworthy feature of farming in these districts is that there are few tracts elsewhere with so much 'made' soil by human efforts. The farmers have taken great pains to redeem the otherwise sandy or stiff clay by manuring, irrigation, drainage and levelling." (p. 2).

As regards the efficacy of service co-operatives, we need only refer to the example of Switzerland, Netherlands, Western Germany, Italy, Norway, Belgium and France where an average arable holding varies from 7 to 16 acres, but which have made a success of service co-operatives. If, however, it is intended to convey that service co-operatives are of no avail where the cultivators possess only tiny, subsistence holdings it should suffice to state that, according to the 1950 World Agricultural Census, the average farm holding in Japan (with only 12.5 million acres of cultivated land and 6.2 million farm households) is roughly 2 acres. Farmers who cultivate less than 1.25 acres represent 41 per cent., those who cultivate less than 2.50 acres represent 73 per cent and those who cultivate less than 3.75 acres represent 88.5 per cent of all farmers. It will not be irrelevant to point out here that the strength of a farm household in Japan is 6.0, while in India it is 5.1 and in the USA, only 4.5. Yet, the service co-operatives are a great success in Japan. In this connection we cannot do better than quote from the Patil Delegation's own report :—

> Although there are no co-operative farming societies, Japan has a highly-developed co-operative structure in the field of credit, marketing and supply. More than 95 per cent of the total farm households are members of co-operative societies, which supply 39 per cent of the total agricultural finance and hold 65 per cent of the total savings of the farm households. 96 per cent of surplus rice and 85 per cent of the surplus wheat and barley are marketed through co-operatives. (p. 103)

As regards the argument that service co-operatives in a community of uneconomic holders cannot be a success because they have no savings, it will, perhaps, not be irrelevant to refer here to the campaign for acquisition of *bhumidhari* or proprietary rights by tenants on payment of ten times the rental launched in the Uttar Pradesh in 1949. It was argued by some at the time that there were no savings with the villagers to be mopped up, especially the small holders had absolutely no savings to acquire *bhumidhari* rights and that the Government were chasing the will-o'-the-wisp. The following table will, however, show that in the thirteen districts out of the first fifteen, which stood at the top till June 30, 1950, by far the large majority of *bhumidhars* consisted of erstwhile tenants possessing only very small holdings—smaller than the average for the

district. The percentage of cultivators in the entire State who held 2 acres and less was 31, while in Basti, Gorakhpur and Jaunpur the number stood at 37.5, 39.7 and 40.0 respectively[1]—

TABLE XVIII

Name of District	TARGET			ACTUALS		
	Total rent of which ten times was expected (in hundreds of rupees)	Number of *khatas* (in hundreds)	Average rent per *khata* in the district (rupees)	Total rent of which ten times was deposited (in hundreds of rupees)	Number of *khatas* (in thousands)	Average rent per *khata* for which deposit was actually made (rupees)
Muzaffarnagar ...	35,720	2,19	163.1	21,435	1,14	188.0
Meerut ...	49,593	2,92	169.8	23,613	1,32	178.8
Saharanpur ...	35,083	2,16	162.4	14,619	91	161.3
Basti	42,639	10,45	40.8	17,032	4,69	36.28
Gorakhpur ...	30,946	8,07	38.3	9,389	2,96	31.6
Mirzapur ...	14,144	1,15	122.9	4,172	41	101.7
Jaunpur	14,568	2,54	57.1	3,965	1,05	37.6
Naini Tal ...	1,601	9	179.3	427	3	142.3
Bulandshahr ...	49,690	2,47	201.1	12,941	77	168.0
Jhansi	13,793	2,32	59.4	3,512	62	56.4
Dehra Dun ...	3,691	24	153.8	932	8	116.5
Mathura	32,142	1,72	186.8	8,071	46	175.4
Aligarh	57,083	1,88	303.6	12,415	56	221.4
Hamirpur ...	22,317	2,83	98.3	4,753	68	69.89
Agra	43,490	2,65	164.0	9,211	65	141.7

So far as possibilities of reclamation through co-operative farms are concerned, as will appear later, there is little land waiting to be reclaimed. Also, experience shows that individual farmers under incentive of a high price of agricultural commodities are better able to reclaim cultivable waste. In the state of Uttar Pradesh, individual farmers since the second war reclaimed some 37 lakh acres, while the Government could reclaim only 1,40,000 acres during the same period after spending huge amounts of money.

Lastly, in this connection we have to remember that our economic salvation in the sphere of agricultural production lies in still better utilisation of the land already under the plough, rather than in bringing marginal and sub-marginal land under it.

[1] *Economic Condition of the Peasant*, an article by the author, published in the *National Herald*, Lucknow, dated April 23, 1951.

As regards the fourth advantage, *viz.* that of planned crop rotation and more rational use of land being possible on co-operative farms, there seems to be some confusion. What exactly is the objective of crop rotation ? Obviously, preventing the soil from getting exhausted and maintenance of its productivity. If so, this objective is better served, as we have already seen, by a system of small farms, wherein big machinery is not used and more farm-yard manure is produced, thus helping maintenance of soil fertility. The charge that small holders are not able to practise crop rotation can possibly be laid only against such of them as are greatly uneconomic or sub-basic holders, but even this does not help the critics much. For, such farmers will not raise commercial crops which exhaust the soil and will, for their own subsistence, resort largely or wholly to food-crops which are not all or so exhausting and along with which nitrogen-fixing legumes can be easily sown or grown. Crop rotation is not essential to good farming in all circumstances; mixed cropping so widely practised by small farmers can serve the purpose equally well. Nor do the small farmers lag behind in double-cropping and raising of high-yield varieties. Only there are two stipulations: in order that cattle dung may not be burnt, cheap fuel has to be provided through community planting of non-arable, village lands, and, where necessary, a law has to be enacted preventing, particularly, very small farmers from sowing sugar-cane or other exhausting crops, say, in more than one-third of their land in a year.

The fifth argument relates to reduction of costs on a large farm. It is not clear, however, which wasteful operations on a small farm the critics have in mind. Perhaps, they refer to loss of time involved in trips that men and bullocks have to make to the various scattered plots into which a cultivator's holding may be divided, and to loss of water that may be entailed in irrigating such plots whether from a well or a canal. If so, these defects will be removed when these plots are consolidated into compact blocks. It does not take a large jointly-operated farm to eliminate such waste of time or water. Anyway, reduction of operation costs is not our primary aim, at any rate, at the expense of a higher yield. Small farms require comparatively more human and animal power than bigger ones, and this is not of much consequence because owners of such farms do not have to pay for it. So that even if the money costs are reduced in a big farm, it will still be preferable to have smaller ones in view of their greater yield and the available surpluses of labour and cattle. There are no scarce capital resources which are wasted on small farms in our country. Text-book writers

of western countries have mostly 'machinery' in mind while using this terminology. In the context of our conditions, the bullock is almost the only capital resource of a small farmer which is, however, not so scarce.

On the contrary, costs on a large co-operative farm will be far greater than what they are on small farms taken together. Owing to the need of detailed supervision and a complicated system of accounting, overhead costs are bound to be very high, which will more than off-set any economy that may be effected by mechanisation of the farm and rationalisation of labour. "As the size of the unit increases, the difficulties and costs of management also increase faster in agriculture than in industry. The workers are spread over a much wider area and the supervision required is much closer than in industry. Thus it becomes necessary to have supervisors for every small group of workers. But, again, because of the nature of the operations the supervisors cannot be fully occupied merely in supervision. In other words, a complete separation of managerial and manual functions is very uneconomical in agriculture".[1] This accounts for the excessive costs of supervision and management in the Russian collective farms about which there has been continuous criticism in Russian economic literature. As much as 41 per cent of the total work-days are reported to have been spent on payment for administration and service personnel in Russian Collectives.[2] It is due to the diseconomies of large-scale management in agriculture that the size of the optimum unit is relatively low in agriculture in most countries—except where the abundance of land and shortage of labour makes the existence of large mechanised farms unavoidable. These diseconomies begin to offset the other economies of scale fairly soon. That is why net returns per acre on smaller family farms are often higher than on large-scale farms.[3]

The above applied only to working costs. The initial costs that will be required in setting up a co-operative farm will not be negligible. New investment of capital in the form of manager's office, cattle sheds, godowns etc., will have to be made while the existing ones owned individually by farmers will have little or no use.

Now to the sixth argument: it is claimed that co-operative farming (as distinguished from collective farming which, some of our public men grudgingly concede, has not proved a success in the

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[1] *Economics of Agriculture*, Cohen, p. 56.
[2] *Co-operative Farming*, Talpade, p. 3.
[3] Vide *Co-operative Farming*, a monograph published by the Indian Co-operative Union, New Delhi, 1957, p. 14.

USSR and may not be practicable in our conditions of a democratic set-up) provides a solution for the evils of uneconomic holdings and fragmentation. A little thought will, however, reveal that, at least, so far as fragmentation is concerned, we need not resort to co-operative or collective farming in order to obviate it. Fragments of land belonging to one farmer, but lying scattered and at a distance from one another, can be easily consolidated into one block or two, compulsorily through law or voluntarily through co-operation amongst farmers. Consolidation of holdings has been carried out in several countries, resulting in great benefit and satisfaction to the peasantry.

That there are a larger number of uneconomic holdings in the country is admitted. But it will be pertinent to point out here that they do not form such a large percentage as is generally assumed. The number of actual cultivators is smaller than might be calculated on the basis of entries in revenue records. The whole confusion in this respect, which has marred the conclusions of so many, otherwise ably-written books and reports, arises from the fact that persons, families and holdings have all been mistaken one for another. For example, the cultivating population of Uttar Pradesh in 1945 stood roughly at 75 lakh families, but the number of persons entered as cultivators in revenue records (barring tenants of *Sir* and sub-tenants which must have counted nearly two million and a half) stood at 122.8 lakhs and the number of their holdings at about 200 lakhs. The explanation lies in the fact that smaller peasants usually possess more than one holding, sometimes three and even four, and sometimes names of more than one member belonging to a joint family are entered in the records. In 1945 the number of holdings, possessing an area of four acres or less each in Uttar Pradesh stood, according to the Zamindari Abolition Committee Report, at 75.5 per cent, but the actual number of families which held four acres or less each would not exceed 45 per cent. Dr. Otto Schiller, German Professor of Agricultural Economics, who served three half-year assignments from 1953 to 1956 in West Punjab (Pakistan) on behalf of the Food and Agriculture Organisation of the United Nations, and made a survey of two villages on the spot, has also reached the same conclusion about the conditions in Pakistan.[1]

Points about 'lack of capital resources and low level of technique and productivity,' which characterise small subsistence holdings, have already been dealt with. As regards under-employment on these holdings, it is true that these holdings do not provide full

[1] Vide *Co-operative Farming and Individual Farming on Co-operative Lines*,— All-India Co-operative Union, 1957, pp. 19-20.

employment to the peasants all the year round and are, therefore, uneconomic, leading to poverty, and should go as soon as possible. But mere pooling of land is no remedy: it does not create more employment. If one hundred persons possessing, say, two acres each and operating them separately, have to remain idle today for a good part of the year because of lack of sufficient land, one fails to understand how—by what magic—these persons will be able to find full employment throughout the year, merely because their land has been pooled into a farm of two hundred acres where they now work jointly or under a unified direction. The number of acres in the total has not increased by the pooling, nor has the number of workers gone down. The proportion of rural population to the land available remains as before.

Dr. S. Chandrashekhar, Director of the Indian Institute for Population Studies, Madras, who saw four communes in action, writes in the *Statesman*, New Delhi, dated January 10, 1959—

> Not only do the Chinese work all the time, but in massive numbers. One sees 20 people pulling a loaded cart—some pulling with ropes like animals and some pushing from behind. One would expect in a 'People's Democracy' that people would not be substituted for animals. But I have even seen men and women pulling a plough!
>
> The reason for this unhappy phenomenon is that people are at the beck and call of the regime and they need not be paid high wages. So the economy can afford to waste human labour which, in terms of dignity and monetary value, means nothing. What could be accomplished by two people is done by 20. A hundred people toil on one acre of land and literally thousands work to put up a building on a shift basis.

If anything, unemployment in a co-operative farm is likely to increase, for, more likely than not, the farm management will, in the interest of smoother management, take to mechanisation.

The final, heavy-weight reasoning in favour of co-operative farming proceeds thus: we are in desperate need of funds or capital for making up the leeway. But programmes which have been undertaken for industrialisation and development of communications already place a heavy strain on the available resources. Nor can we emulate countries like Japan and England where economic development took place during a period of colonial expansion and a comparatively monopolistic access to raw materials. At that time, social consciousness had also not advanced so that internal exploitation could go on unchecked. Thus, through internal and external exploitation, large stocks of capital were created in these countries which form the basis of their industrial and economic prosperity. We have no colonies which we can or would exploit and, therefore,

we have to depend upon our own resources. Capital has to be found out of our own efforts and our own savings. At the same time we have declared ourselves a 'Welfare State' and cannot, therefore, think of exploiting our people—exploiting in the sense a colonial or a capitalist government does. We have, therefore, to so reorganise our economy that it makes fullest use of our man-power which is our greatest asset, that it produces more and saves more. In the present agrarian economy based as it is on family-farming in small units, possibilities for savings and capital formation are severely limited. Co-operative farming, it is stressed, offers the only solution for mobilising the national resources in which man-power plays the most dominant part.

The argument is naive. It assumes that as soon as land, dispersed today in small holdings, is pooled and jointly worked and agricultural labourers and, may be, other landless people also are made members of the joint farm and management, the land will begin to produce more per acre—produce a surplus to the needs of those who work it, just as large private farms do. This marketable surplus is expected to prove the chief source of investible industrial capital for development of the country. No pains are, however, taken—no facts and figures are given—to prove how this miracle of greater production per acre will come about or whether it has actually come about in countries where large-scale joint farming has been introduced. The argument displays a pathetic, but unexplained, faith in large-scale units in conformity with Marxist thinking.

Dr. Otto Schiller points out:

> It is not high productivity per acre which enables the large farms to play a predominant role for the supply to urban markets but the fact that less population and mostly also less livestock are attached to the same acreage as compared with the area of small holdings. The introduction of co-operative farming would improve the supply to urban markets, only if it leads to higher productivity per acre or to a shift of population. Both effects, however, are not automatic consequences of co-perative farming but depend upon other factors which can exercise their influence also under the conditions of individualistic farming.[1]

It is high productivity per acre which is the crux of the matter. Once this is achieved, as it can be on small, independent farms, the peasants will have more to consume and also more to sell. Even today they market the last grain they can. Unless, therefore, it is intended to extract from the peasantry a greater surplus than is left after bare subsistence has been kept back, and unless our planners wish to emulate the mode of capital formation adopted in

[1] Vide, p. 13.

Russia, Eastern Europe and China,** where the State (through its direct control of collectives, large, compulsory low-price deliveries, heavy taxes, etc.) forced down the actual consumption levels of the peasantry in the name of capital formation—incidentally, if this is not exploitation which the advocates of co-operativisation professedly want to avoid, nothing else is—there is no case for co-operative farming.

It is true that farms in India and some other countries are too small—smaller than the best economic unit for profits. They are so small because, land in the country and other occupations also in which the farmers could engage being limited, the farm land inherited from their fathers has to be redivided amongst each succeeding generations of sons. It is an irrefutable proof of over-population. But the relevant point here is that, could large-scale agriculture be carried on more successfully, or produce more and give happiness to those engaged in it, should we not expect that logic of technological advance, *i.e.* economic and other forces by themselves would have, just as they did in manufacturing industry, led to the gradual disappearance of the small independent farm and its replacement, without any pressure from the State, by big units worked jointly by hundreds and thousands of persons? On the contrary, we find that the larger unit, almost wherever it existed, has been broken into small ones—a unique instance of deviation from the laws operating in manufacturing industry—and the average agricultural "business" all the world over, where a deliberate imposition has not been made from above, remains as small as ever, with the peasant farmer as its owner and worker, manager and financier, all rolled into one. The peasant has refused to be fitted into any slogan: his is a role which has defied all economic theories. Indeed, it is not possible for modern economics, nursed in the field of capitalist agriculture with the background of 'wage and labour' and the criterion of as much rent or profits as possible, to give a true insight into the socio-economic nature of wageless family economy that the peasant agriculture symbolises.

** Vide a news-item published in the *National Herald*, Lucknow, July 2, 1959:

2,00,000 Houses Destroyed By Flood In China

Hongkong, July 1: In a press interview at Canton, which was published here yesterday, Mr. Tao Chu, First Secretary of the Chinese Communist Party's Provincial Committee for Kwantung—the province in South China where 2,00,000 houses had been destroyed by the recent flood of the East River—disclosed that in view of the serious situation in Kwantung, Peking had approved that his province be exempted this year from its regular duty of exporting grains and food-stuffs. *(China has committed herself to a number of countries with supplying a huge tonnage of rice and wheat in exchange for machinery and strategic goods. A contract signed at Colombo this month committed China to ship 2,30,000 tons of rice for exchange of Ceylonese rubber. Domestically, each province of China is under obligation to contribute grains to the Central Government for exportation).*

At the time when Marx laid it down that in agriculture, as in industry, property was becoming increasingly concentrated and the large producer was bound to displace the small producer, scientific inquiry into agrarian problems had not yet begun and his plausible parallelism between agriculture and industry seemed incontrovertible. "But soon after the appearance of the third volume of *Capital* in 1894", says David Mitrany, "the planks of the Marxist platform began to give way. The German population census of 1895 (the first since 1882) disclosed the peasant's astounding refusal to die. Between 1882 and 1895 the number of holdings of 2 to 20 hectares had increased by 1.26 per cent and the total surface they covered by 659, 259 hectares (about 1,650,000 acres). The same phenomenon was reported from countries as different as the United States and Holland. And the German census of 1907 killed the concentration theory altogether. It showed that notwithstanding the many favours which capitalist agriculture had received from the State during the preceding years, large estates and farms were constantly losing ground".[1]

On the contrary, peasant holdings prospered and multiplied because of the greater care and interest the peasants put into their work, and also because of the fact that their demands were sometimes lower than even those of rural labourers. His readiness to work harder and to consume less could be explained by the peasant's attachment to his land, as it explained his readiness to pay almost any price for it. "For the capitalist, property or tenancy is a means of employing his capital; for the proletarian, artisan and the small peasant, property is rather a means of employing his labour", said Otto Bauer, the Father of Austrian Socialism 25 or 30 years ago. The excess over the normal price which the small holder is willing to pay and the hard work which he willingly puts in, may be called the premium which he pays for his independence. It is this love of the peasant for his plot of land and for his independence that we can mobilise and put to great advantage if we give him the encouragement and co-operation he needs. On the contrary, we are trying to destroy this love or this instinct of his, which could come to our rescue when we want more food and more exportable raw materials from our land. The Patil Delegation, unmindful of what effect it will have on its arguments in favour of co-operativisation, observed as follows:—

> Every family in the co-operative had been allotted a small plot of land close to their house for vegetable cultivation. If there was no suitable land near the house, a piece of land in the fields close

[1] *Marx Against the Peasant*, George Weidenfeld and Nicolson Ltd., London, p. 25.

to the village site was given. This appeared to be the general system in all the co-operatives. These plots were very carefully and intensively cultivated and it was a treat to see many of them growing a rich crop of vegetables. (Report: pp. 9-10)

We do not know whether the question as to why the Chinese peasants devoted more attention to these plots (and, therefore, presumably produced more on them per acre) disturbed the members of the delegation or not when they signed the report in favour of co-operative farming.

It is sometimes said that in India "land has been further concentrated in fewer and fewer hands and there has been more and more proletarisation of small peasants". This is not a correct appraisal, at least, so far as Uttar Pradesh[1] is concerned of which figures are available to us—

TABLE XIX

PRINCIPAL MEANS OF LIVELIHOOD	1901	1911	1921	1951
Cultivators	48.53	59.80	64.18	67.41
Agricultural Labourers	9.03	9.48	8.68	5.71
Rent receivers	7.11	1.80	1.76	1.06
Total—	64.67	71.08	74.62	74.18

Figures of 1931 and 1941 have not been given because in these two censuses the occupation of workers alone has been recorded, and not of the entire population.

According to the Census Report of India (Vol. I, Part I—A Report, pages 155-56), during the twenty years following 1931, the percentage of cultivating labourers to all workers on land has fallen in Uttar Pradesh (18 to 9), Orissa (30 to 19), West Bengal (40 to 28), Madras (38 to 35), Bombay (43 to 18), Madhya Pradesh (43 to 32) and Rajasthan (11 to 4). The percentage has remained practically unchanged in Bihar (26-27), Mysore (13-14), Hyderabad (31) and Punjab (11-12). There is only one major state where this percentage has increased—Travancore-Cochin (34 to 47).

The fall in the percentage of cultivating labourers is the natural result of increase in the number of cultivators. According to the Report the proportion of agricultural rentiers, which was already small in 1931, became still smaller in 1951.

Whatever other conclusions may be drawn, these figures are an unmistakable tribute to the inherent internal strength of the system of peasant farming, its adaptability to changing circumstances, its capacity to bear the stresses of modernisation, and above all its power to endure.

[1] *Census Report of Uttar Pradesh*, Part I-A, 1951, Table 79, pp. 96-97.

CHAPTER VII

EMPLOYMENT

Apart from the agricultural area, that is, arable and pasture lands that a country may possess, it is the availability of non-agricultural resources and, consequently, the density of agricultural population that will determine whether the country will have large-scale farming or intensive peasant farming. Of the three factors of production, *viz.*, land, labour and capital, the one which is the most scarce and, therefore, dearest will be exploited more than the other two. Where land is plentiful, that is, a cheaper factor, and men few in number, the latter will not make the fullest use of the former. They will not try to obtain the highest yield per unit of land, but will bring a greater area of land under cultivation. In other words, large farms will come into existence and agriculture will become extensive. The more, however, the value of land increases relatively to labour (and capital), that is, the more the population or, to be exact, the more the agricultural population increases and the more scarce the land becomes, the greater yields will the cultivator seek to obtain from it by the use of increasing units of labour (or capital, or of both). In other words, small farms will come into existence and agriculture will become intensive. Extensive methods enable the farmer to obtain the biggest net return per unit of labour (and capital); intensive methods, however, give him a smaller net return per unit of labour (and capital) but a bigger net return per unit of land.

Below is given a table showing the availability of land per capita of the entire population and per economically active person in agriculture on the various countries (pp. 77-78).

It is clear that Australia, New Zealand, the USA, Canada and the Union of South Africa, with more land relatively to population engaged in agriculture, can afford the luxury of large-scale, extensive farming whereas China or Japan, India or Pakistan, Italy or Germany, Norway or Netherlands, Egypt or Indonesia, with greater population engaged in agriculture relatively to land that is available, must of necessity have small-scale, intensive farming.

India is faced with the problem of unemployment. National interest, therefore, demands an agrarian economy which, while serving to extract the maximum out of land that constitutes the limiting factor in our circumstances, will provide the optimum of enployment for the rural folk. Such an economy can

TABLE XX

Statement showing Availability of Land Per Capita and Agricultural Land per Economically Active Person in Agriculture in Various Countries

Per Capita Area in Cents (Cent = .01 acre)

Sl. No.	Country	Year	Total area	Land area	Arable land and land under the crops	Permanent meadows and pastures	Forests and wood lands	Other land area	Economically active population in agriculture: Year	Economically active population in agriculture: In thousands	Per economically active person in agriculture: Arable land (in cents)	Per economically active person in agriculture: Permanent meadows (in cents)
1	2	3	4	5	6	7	8	9	10	11	12	13
1	Australia ...	1952	22,000	N.A.	550*h*	10,885*i*	543	10,563	1947	498	9,713	179,575
2	Argentina	1953	4,820	4,273	466	1,759	2,643	1,006	1947	1,622	1,550	4,338
3	Brazil* ...	1950	4,049	4,024	96	512	2,283	1,159	1950	10,370	290	1,553
4	Belgium ...	1953	86	N.A.	29	20	17	20	1947	423	610	415
5	Chile ...	1949	3,089	3,070	158	396	679	1,857	1952	648	436	1,089
6	Canada ...	1951	17,561	16,485	691	388	6,029	10,453	1951	1,008	9,608	5,398
7	China ...	1947	519	504	49	103	45	322	...	N.A.	...	...
8	Denmark ...	1953	242	239	155	21	25	41	1950	518	1,312	181
9	Egypt ...	1950	1,209	N.A.	30	...	0	1,179	1947	4,245	143	...
10	France ...	1952	320	N.A.	124*d*	71	66	59	1946	7,484	703	407
11	Germany (East) ...	1949	151	N.A.	71	18	41	21	1946	2,378	529	134
12	Germany (West) ...	1953	123	121	44	28	35	16	1950	5,113	418	268
13	India ...	1952	221	N.A.	98*a*	6*b*	30	92*c*	1951	71,809	475	29
14	Indonesia ...	1947	484	N.A.	36	...	258	190	...	N.A.	...	...
15	Italy ...	1953	155	152	81	26	29	19	1954	8,468	457	149
16	Japan ...	1951	108	N.A.	15	4	66	23	1950	17,230	73	19
17	Mexico ...	1950	1,887	...	179	645	372	691	1950	4,824	552	1,993
18	Newzealand	1953	3,242	3,208	60	1,620*g*	1,053	609	1951	135.9	907	22,897
19	Norway ...	1953	2,384	2,271	61	16	551	1,756	1950	380	564	149
20	Netherlands	1953	83	78	24	31	6	22	1947	747	347	417

TABLE XX—(*contd.*)

Per Capita Area in Cents (Cent = .01 acre)

Sl. No.	Country	Year	Total area	Land area	Arable land and land under the crops	Permanent meadows and pastures	Forests and wood lands	Other land area	Economically active population in agriculture: Year	Economically active population in agriculture: In thousands	Per Economically active person in agriculture: Arable land (in cents)	Per Economically active person in agriculture: Permanent meadow (in cents)
1	2	3	4	5	6	7	8	9	10	11	12	13
21	Pakistan ...	1953	308	N.A.	79*jk*	...	8*k*	221	1951	17,124	351	...
22	Switzerland	1953	209	202	22*f*	88	50	49	1950	355.4	310	1,202
23	U. K. ...	1953	119	117	36	59	8	16	1951	1,116	1,623	2,674
24	U. S. A. ...	1953	1,211	1,192	299	395	389	128	1950	7,331	6,518	8,608
25	U.S.S.R. ...	1947	2,657	N.A.	268	148	1,098	1,143	N.A.	N.A.	...	...
26	Union of South Africa	1953	2,197	N.A.	164*l*	1,6[illegible]4	19	350	1951@	2,395.5	902	9,139

Foot Notes—1. The above table has been built on the figures of area taken from F.A.O. year book 1954, on the figures of total population used for finding area per capita in different countries taken from Demographic Year Book U.N.O. 1948, 1951, 1954, and U.N.O. Statistical Year Book, 1956, and on figures of economically active population in agriculture taken from U.N.O. Statistical Year Book, 1954.

2. As the figures of total population were not available for the years for which total area was available, the figures of total population for 1951 for U.S.S.R., for 1947 for Argentina, for 1952 for Chile, and for 1950 for Germany (East) were taken for computing figures of area per capita for these countries.

3. The working force of the U.S.S.R., according to an article in the 'International Labour Review', May 1956, page 503, stood at 88.0 millions in 1950, of which 45 per cent i.e., 39.6 millions were engaged in agriculture. Collective farms in the entire country have an area of 450 million and state farms about 65 million acres of arable land. So, the average arable land per person actively engaged in agriculture in the U.S.S.R. comes to about 13 acres or 1,300 cents.

@Figures of Non-Whites for 1946 and of Whites for 1951.

(*a*) Area sown and fallow land. (*b*) Un-cultivated permanent grasses. (*c*) Abandoned land, land known to be cultivable and areas under bamboo and thatching grasses. (*d*) Including area of fish ponds. (*e*) Of 1944. (*f*) Arable land including fallow only. (*g*) Data refer to agricultural holdings exceeding one acre (0.405 hectare) and situated outside Borough. (*h*) Includes cultivated grass lands. (*i*) Rough grazings only. (*j*) Total agricultural area. (*k*) Data relate to the reporting area. (*l*) Includes wattle plantation. (*) In agricultural holdings as ascertained by the 1950 Census of Agriculture which covered an area of 234 million hectares.

only be an economy of small farms as distinguished from that of large farms, whether private or co-operative. In fact, small-scale economy, both in the field of agriculture and industry, is the major solution of our unemployment problem.

Small holdings limit the use of machines and lead to intensive agriculture which finds employment for manual labour in far greater numbers than does extensive agriculture or large farms worked by machines. The number employed per 100 acres in countries where small holdings predominate is greater than that employed in countries where large holdings form a large percentage. In the Irish Free State, for example, on equal areas of land thirty years ago there were five times as many persons working on farms of 15 to 30 acres and three times as many on farms of 30 to 50 acres as on farms of over 200 acres. Similar results were obtained from English, German and Danish statistics. According to Lord Addison, an ex-Minister of Agriculture, records prepared for the Government in 1930-31 for thirty-five different county council estates comprising nearly 17,000 acres, showed that population on these council lands, after they had been divided into small holdings, had increased from 1,048 to 2,298.

Machinery can be profitably used only to the extent to which it saves labour that might otherwise be productively employed, or to the extent it performs work that hand labour cannot do, or cannot do as well, or cannot complete quickly enough to enable farm operations to be done at the most suitable time for maximum production. But a good proportion of labour in our rural areas is already going unemployed or under-employed today; there is no work in the sphere of agriculture that human or animal labour cannot perform, and, our country being a land of small farms, our farmers can easily procure labour in the village itself or in the neighbourhood that may be required to complete any farm operation in the quickest possible time.

Not only that mechanisation of agriculture is unnecessary, impracticable in our conditions, or too expensive: it will also lead to unemployment. As use of machinery makes it possible for a smaller number of workers to cultivate a larger area, a large farm served by tractors, combine-harvesters and threshers, employs less labour than small farms covering the same area. When machinery is employed, labour is necessarily saved. In one and a half hours a tractor can plough one hectare of land and a combine-harvester can harvest an equal area in one-third of the time. A labourer who formerly ploughed hardly one acre with a pair of bullocks will be able to plough at least 12 acres a day with a tractor. The average area of land per farm increased in the USA from 136 acres in 1890 to 215

in 1950, while the number of workers per farm in the same period decreased from 2.0 to 1.6, which means that in the USA increasing use of agricultural machinery in these 60 years, on a given area of a farm, led to a fall of 50 per cent in the number of workers. An American expert[1] gives the following estimate of man-hours that were found necessary, at various points of time, as mechanisation has advanced, for growing and harvesting an acre of wheat land yielding 20 bushels:

Man-hours

In 1830—55.7 (seeding and harvesting done by hand)
In 1896—8.6 (Horse-drawn drill and binder)
In 1930—3.3 (Tractor-drawn drill and harvester-combine)

In Sweden the use of farm machinery reduced labour requirements by 50 per cent in twenty years only, *viz.* from 1930 to 1950.

In the USSR in 1927, 25.6 million independent peasant farms contained 100.5 million hectares of arable land and, according to the census of 1926, 114 million persons lived by agriculture, thus giving an agricultural population of over 103 per 100 hectares of cultivated land. In 1937, after collectivisation of agriculture, there were a little more than 18.5 million families cultivating 110.5 million hectares which, at 4.8 members per family, works out at 88.8 million persons or 80 per hundred hectares of farm land. There was thus a fall of 23 persons per 100 hectares of land in a decade owing to mechanisation of agriculture.

Even so, writes Sir E. John Russell, Director of Rothamsted Agricultural Research Station, after his visit to Russia in 1937—

> The number of workers per 100 hectares is usually large according to western ideas, especially if one assumes that much of the work is done by tractors and combines. On the farms I visited it was about two to four times as many as would have been needed in England, but the yields were less and the work not so well done, indicating a considerable difference in efficiency of the workers of the respective countries.

If agricultural labour were rationalised and machinery economically and efficiently operated, it would probably be found that about two-thirds of the present available labour on collective farms would be sufficient for the present type of farming. "If we calculate on the basis of West European norms of labour requirements in farming operations", says Dr. Otto Schiller, "the normal labour input of approximately 100,000 large-scale farms composing Soviet agriculture today with about 1500[2] hectares of crop land each, considering their actual present intensity of farming and their actual

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[1] *Economist*, London, May 6, 1944, p. 592.
[2] 2,000 hectares would be the more correct figure.

degree of mechanisation, we arrive at an excess farm population of at least 30 million".[1]

The Government of the USSR, however, as and when it considers necessary, can employ this surplus labour to bring new land in Siberia and Central Asia under cultivation. But in an ancient country like India, where manpower is running waste and there are no vast areas of virgin soil waiting to be broken up, big mechanised farms would be nothing short of a calamity; industrialisation alone would not absorb tens of millions of workers that would be released from land.

Mr. Hubbard in his *The Economics of Soviet Agriculture*, 1939, says:—"Since 1928 industry in the USSR has absorbed probably between 12 and 15 millions of rural population, but since 1932 the rate of increase in wage-earners in all branches of activity has slowed down. Since industrial labour is steadily improving in efficiency and productivity, it is unlikely that demand will again expand at the same rate as during the first Five-Year Plan, when the total number of wage-earners doubled".[2] Even in the USSR, therefore, throughout the buoyant period of economic expansion when tremendous cities and vast industrial enterprises were springing up all over the face of that country, only one million and a quarter persons—not more than one million and half in any case—were being absorbed into gainful employment each year, whereas in India the rate of increase in population alone calculated at the decennial rate of the last census period, comes to five million a year, not to say anything of the existing tens of millions who cannot be said to be gainfully or fully employed today.

Typical of the view that reduction in employment in agriculture caused by mechanisation will be compensated by a rise in employment in other directions is the comment of Dr. W. Burns, made in his Note on *Technological Possibilities of Agricultural Development in India* submitted to the Government of India on September 30, 1943—

> Use of machines may mean fewer men per operation, but not per acre. There are numerous examples in which modern progressive farming has actually restored the numbers of men employed upon the land. Mechanisation, in addition, creates several new classes, those who make, those who manage and those who repair the machines. It employs, in addition, men-groups who are the suppliers and distributors of the spares, the fuel and the lubricants. Mechanisation, particularly if it involves the transference of machines

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[1] An article entitled, *The Resources and Performance of Soviet Agriculture* by Dr. Otto Schiller, published in *The Journal of Farm Economics*, America, May, 1956, p. 306.

[2] *Ibid* p. 214.

> from one place to another, involves the improvement of roads and here, again, a large prospect of employment is opened up (p. 127).

It is true that mechanisation of agriculture will lead to creation of certain secondary and tertiary industries in which some of the displaced agricultural labour will be able to find employment. But in a country where most of the rural areas are over-populated, where there is already a pressing problem of agricultural labour even on the basis of the existing technique of agriculture, where the joint-family system contains so much hidden unemployment and under-employment, expanding industry's demand for labour, for many, many years to come, is likely to be covered by the existing idle hands there is no economic justification in creating a supplementary labour supply through the mechanisation of agriculture. In the USA, Sweden and other countries, surplus farm labour released by mechanisation of agriculture did not create any problems of unemployment because it was absorbed by industries which developed in the meantime. In Soviet Russia, one of the reasons for introduction of collectivised mechanised farming, thirty years ago, was the belief that it is a pre-requisite for the execution of a huge programme of industrialisation, with its increasing demand for human labour. This reason does not operate in India where agriculture is already labour-surplus today.

The Planning Commission itself has stated that "in agriculture, except under certain conditions, in the present stage of development the possible economic advantages of mechanisation may be more than offset by the social costs of unemployment that such mechanisation would involve" (*Second Five-Year Plan*, p. 113). The surplus of labour in the countryside is already large enough to meet the demand for industrial labour for a long time. It has been estimated that the working-force in agriculture is likely to *increase* from 109.5 million to 111 million during the next five years in spite of the rapid industrial development envisaged in the Second Plan and the creation of non-agricultural employment of the order of 8 million (Plan: p. 115; *Tentative Frame-work*, p. 28). So that at the end of the Second Five-Year Plan there will be further additions to the number of persons seeking work in the agrarian sector.

In the words of Desmond L. W. Anker:

> The building of the pyramids in Egypt or, more recently, of airfields and roads during the war years in China and Burma almost entirely with hand labour indicates what can be done by men working without machines; with the great amount of under-utilised labour to be found in these areas, would it not be preferable to use labour on agricultural development works, and use capital, the scarcest of the factors of production, for purposes more likely to yield greater economic return?

> There would appear to be much to be said, under the conditions prevailing in heavily-populated underdeveloped countries, in favour of techniques for increasing agricultural productivity with a minimum amount of capital. It is claimed that with the use of such methods as improved seeds and application of fertilisers, yields could be increased by 50 per cent without any substantial change in present systems of farming, and without all the adjustments that mechanisation would make necessary. The experience of Japan is illuminating in this respect.[1]

Mahatma Gandhi said:

> Mechanisation is good when hands are too few for the work intended to be accomplished. It is an evil when there are more hands than required for the work, as is the case in India....The problem with us is not how to find leisure for the teeming millions inhabiting our villages. The problem is how to utilise their idle hours, which are equal to the working days of six months in the year.[2]

Pointing out the comparative role of small and big industry in India, Pandit Jawaharlal Nehru wrote in a foreword to *China Builds for Democracy* (1942) by Nym Wales, as follows:—

> Gandhiji has, I think, done a great service to India by his emphasis on village industry. Before he did this, we were all thinking in a lop-sided way and ignoring not only the human aspect of the question, but the peculiar conditions prevailing in India. India, like China, has enormous man-power, vast unemployment and underemployment.....Any scheme which involves the wastage of our labour-power or which throws people out of employment is bad. From the purely economic point of view, even apart from the human aspect, it may be more profitable to use more labour-power and less specialised machinery. It is better to find employment for large numbers of people at a low income level than to keep most of them unemployed.

In our country, with its dense population, the practical politician will have to correct the economic stand-point with the social, and in many respects the economic problem for him will become a problem of population. He will want employment more than he hates poverty. Hands, therefore, must have precedence over the machine in India (even if we equate mechanisation with plenty).

The objection that unrestricted use of machinery will create unemployment is usually met with the argument that the collective or co-operative farmers, who would include the whole rural population, could work only for, say, three hours a day and take holiday for the rest, which will mean more leisure for intellectual pursuits; that in place of so much poverty and starvation of today we

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[1] An article entitled *Some Effects of Farm Mechanisation*, in *International Labour Review*, March 1955, p. 250.

[2] *Man Vs. Machine*, in *Harijan*, 16th November, p. 316, as quoted in *The Mind of Mahatma Gandhi* compiled by R. K. Prabhu and U. R. Rao, Oxford University Press, 1945, p. 122.

shall have a perpetually rising standard of life. But the latter contention does not hold. A large, mechanised joint farm cannot produce more per acre than small peasant farms do. But even if it does, it is doubtful whether a holiday of nine hours of day-light could be regarded as a national gain. That an idle mind is a devil's workshop, cannot be denied. "Leisure is good and necessary up to a point only," says Mahatma Gandhi, "God created man to eat his bread in the sweat of his brow, and I dread the prospect of our being able to produce all that we want, including our food-stuffs, out of a conjurer's hat".[1] Too much leisure demoralises society and it will be an evil day for India when its peasantry succumbs to temptations of ease and pleasure.

The advocates of mechanisation forget that the chief benefit the rational use of machine promises is certainly not the elimination of work; what it promises is something quite different—the elimination of servile work and drudgery. A peasant, however, is his own master and his work on his own farm is not like a labourer's work in a factory, servile or a type of work that the machine was intended to eliminate. We are not opposed to use of all machines by the peasant farmers. Tools and machines which do not dispense with the use of animal power, or take away the need for a peasant farmer's labour and skill, which do not diminish his independence or lead to the disappearance of his very farm, but lighten his burden thereby easing drudgery, and increase the farmer's efficiency and productivity, are to be welcomed. It is to the all-purpose tractor that we are opposed. The tractor strikes at the very basis of independent farming. For, it nullifies the one competitive advantage which the peasant-farmer enjoys over the large farm or farmer, *viz.*, the cheap labour supply of his family.

"If we could have electricity in every village home", Mahatma Gandhi once said, "I shall not mind villagers plying their implements and tools with electricity".[1] In Japan about 97 per cent of all farmers have electricity.

Lastly, although the advocates of co-operative farming in India are not yet clear in their mind as to the traction power they would like to use, when confronted with the objection that mechanisation is likely to lead to unemployment, they sometimes reply that the co-operative farms of their conception will be run with animal power, instead. Now, this is a novel proposal: in the only countries in which co-operative or collective farms have been working for some time they are mechanised. It is already difficult to organise human labour in the various operations on a mechanised farm or *kolkhoz;*

[1] *The Mind of Mahatma Gandhi*, compiled by R. K. Prabhu and U. R. Rao, Oxford University Press, 1945, p. 123 (*Harijan*, 16th May, 1936, p. 111).

it will be still more difficult to do so if we add the work of looking after, say, 50 pairs of bullocks to the tasks of a farm. The personal attention and devotion which the tending of animals demands cannot be forthcoming in a community of, say, 100 persons who have only a joint interest and responsibility. Animals can be best looked after only when they are the exclusive responsibility of individuals. It will not be out of place to refer those who would not learn by their own experience or from conditions in their own country, to a press report about China when the co-operative farms were only just in the process of establishment. China has not the resources to produce agricultural machinery in bulk, nor is it in a position to spare resources for its import. The co-operative farms, as and when they came into operation, were, therefore, being run with animal power. The report says:

> Another aspect of the same trouble is that when beasts are taken over by a co-operative, many perish from neglect through being left out of doors all night or from sheer lack of food, since it seems to be nobody's business to look after them.[1]

The Krishnappa Delegation to China observes in this connection:

> On the whole, Chinese agriculture is weak in animal husbandry. In the production and development plans of co-operatives more emphasis might be given to this aspect of the rural economy. This might require not only a larger allocation of resources but also, perhaps, certain changes of an organisational character. In the breeding and care of cattle, collective maintenance has a part to play but along with it there might be room also for individual families being enabled to breed and look after cattle as much for their own benefit as for the advantage of the community. Since fodder resources are at the disposal of the co-operative, such schemes of animal husbandry development would require special arrangements for making green and dry fodder available to individual families (p. 121 of the Report).

Capital formation and, consequently, industrialisation being a very slow process, any reduction of pressure on land is hardly likely, at least, in the foreseeable future. It is said, therefore, we have to think in terms of re-organising our agrarian economy in a manner that would enable us to provide increased employment opportunities within agriculture itself. The advocates of co-operative farming contend that it will not lead to unemployment but will open up new avenues of employment for those who are unemployed or underemployed today.

It is argued that our villagers today suffer from under-employment while, side by side, there exists a large employment potential. On the one hand, according to the Committee on Problems of Reorganization appointed by the Planning Commission's Panel on Land

[1] Vide *Hindustan Times*, New Delhi, dated May 15, 1956.

Reforms, those who have rights in land do not generally possess an adequate area of land for their own full employment or the employment of surplus labour in the village. On the other, there are wells to be constructed, tanks to be dug and repaired, irrigation channels to be extended, drainage works to be executed, houses and roads to be built, local manure to be conserved, and if soil erosion is to be checked, land has to be terraced, bunded and afforested, etc. Also, there are large areas which have gone out of cultivation due to soil erosion and have to be reclaimed. All these works are of labour-intensive nature. Things have to be so arranged that the huge under-employed (and unemployed) population in the rural areas is utilised in executing these works, *i.e.*, in creating capital or physical assets—assets that will increase the production potential. But as long as peasants are tied down to their small plots of land they are not free to leave it for considerable period to work on the creation of capital assets. Even if they have to work only for one or two hours a day to look after their cattle or land, they cannot leave the land. The existing pattern of land-use and management, that is, individual farming, thus impedes full utilization of man-power. In a way, under-employment is an economic compulsion under conditions of individual farming. This compulsion or under-employment can be removed only by organisation of the existing small and uneconomic holdings into co-operative farms which, through rationalisation of work and pooling of resources, will release labour for capital formation and intensification of agriculture. Such fuller and more continuous employment, it is said, has helped to reduce and to a considerable extent even to eliminate the worst forms of rural poverty in China. This, according to the Krishnappa Delegation to China, is a lesson of great value to India. The delegation, however, is best with doubt in the very next sentence when it says—'Nevertheless, it may be difficult for a rural economy so greatly dependent on agricultural operations as that of China to continue to expand indefinitely work opportunities in farms for which the main resource needed is organised human labour' (Report, p. 121).

Earlier in its report the Delegation on this very question observed as follows:

> In reply to a question on the effects that the formation of co-operative farms on a large-scale was likely to have on the employment problem, Mr. Chou-En-lai said that the problem should be looked at from the point of view of two sectors and two periods. The two sectors were the villages and the cities and the two periods were the present and the future. So far as villages were concerned, in the short period, lots of work had to be done. Apart from cultivation, water conservancy projects had to be undertaken, reservoirs and tanks had to be dug and roads had to be built. All these re-

quired a lot of labour and the formation of co-operative farms made some of these activities possible and absorbed a considerable amount of labour of the co-operative farmers. But this state of affairs obviously could not be expected to continue for a long time. Soon a stage was bound to come when all the water conservancy projects in the village would be finished, all the roads would be built, and then there would arise the problem of some surplus labour in the village. Steps have, therefore, to be taken during the interim period for the utilisation of this surplus labour for the production of agricultural by-products. There was a good market for agricultural by-products and if the surplus labour in the rural areas could be absorbed by developing these by-product industries and in other subsidiary occupations in the villages, the problem could be solved to a considerable extent. Of course, during the same period if there was a certain amount of industrialisation in the country that would draw away a number of surplus labourers from the villages. He felt, however, that, by and large, most of the rural workers would have to be employed in the village itself. It was mainly the educated and trained workers who could migrate to the cities and find some employment there (p. 27).

We leave it to the reader to judge for himself whether the question of additional employment through co-operative farming has been satisfactorily answered by this delegation. The Dissenting Minute of the Delegation, however, has to say the following in this regard:

> The argument that if agriculture is collectivised, there will be work for all is not borne out even by our Chinese experience, because there we found that, in a vast majority of the co-operatives, there was great under-employment. The members were not employed even for 200 days in a year. Most of the co-operatives have also to rely on subsidiary occupations. Subsidiary occupation has a loose meaning in China and, in fact, we found examples where working as labourers on a road being constructed by Government was also taken as subsidiary occupation. Payment received by the members on the road-work was very low, so the difference was made up by the co-operative—which meant—at the expense of the members. Even the Minister, Mr. Liao, admitted displacement of labour by formation of co-operatives and said 'extra labour available due to pooling of land is transferred to subsidiary occupations which are suitable for a particular area' (Report: p. 212).

The Food and Agriculture Minister of the Government of India, while inaugurating a two-day conference of representatives of state co-operative institutes in New Delhi on April 18, 1956, was pleased to observe that the scheme of agricultural producers' co-operative societies would not result in a surplus of labour. He said that "the position today was that in addition to a large number of unemployed persons in the agricultural sector there was a good number who were under-employed. The creation of co-operative farms with medium and small-size holdings would provide full employment to many.

By the introduction of small-scale industries it would be possible to find employment for others". The Planning Commission's Panel on Land Reforms also holds much the same view when it says that "the other advantage would be that a considerable amount of industrial work for self-use could be organised very much better in these co-operatives".

But, if it is the small-scale industries which will have to be established to provide full employment on a co-operative farm, one is intrigued to know why they cannot be established independently of a co-operative farm. Fifty-two per cent of farmers in Japan possessing, on the average, a holding of two acres carry on home and small industries in their spare time, without having first organised themselves in agricultural producers' co-operatives.

Perhaps, it will not be out of place to refer here to the belief, often voiced, that peasant-farming cannot be carried on except with the help of hired labourers, who enjoy no security today and eke out their existence somehow in a state of semi or gradual starvation, and that co-operative farming alone offers a solution. Both the beliefs are, however, unfounded. There is no agricultural labour worth the name in the Hariana districts of the Punjab, and whoever does not possess land in western parts of Germany where, too, the holding is almost as small as in the Punjab, is engaged as an industrial worker in the factories. The existence of landless agricultural labour, therefore, is not essential to peasant farming. In both these parts of the world the peasant's wife works in the field shoulder to shoulder with her husband and, instead of being a burden to him, as in certain other parts of India, she is an economic treasure to her life-mate. "The Jat woman in the Punjab does not plough, dig or drive a cart, but there is no other form of agricultural labour which she does not practise and ordinarily adorn", says Dr. Radha Kamal Mukerji.[1] Further, during periods of harvesting and on other occasions when time is a great factor, peasants can and, where necessary, do collaborate among themselves for providing the necessary labour.

As regards availability of employment in a co-operative farm for those who are landless today, well, it is simply not possible. If there is not enough land to go round, or, if it does not suffice even for those who are engaged upon it as cultivators today, we will have to find employment for the landless in occupations other than agriculture. A co-operative farm, if it is mechanised, will, rather, throw out of employment quite a good percentage even of those who are employed today.

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[1] *Rural Economics of India*, 1926, p. 71.

CHAPTER VIII

EQUITABLE DISTRIBUTION OF WEALTH

In view of the small agricultural area as compared with the number of those who subsist on agriculture today, and will, of necessity, continue to do so tomorrow, there can be no place for large, privately-owned farms if it is our intention to build up an economy where wealth will be equitably distributed. So, taking away of land from large individual farms in excess of whatever ceiling may be decided upon, and its distribution amongst the landless and the holders of uneconomic farms, is an obvious course dictated by the principle of social justice enshrined in our Constitution. The Committee on Tenancy Reform constituted by the Panel on Land Reform appointed by the National Planning Commission has put the case admirably. It says—"There is no doubt that such solution will be welcomed by the large masses of the landless population; possession of land gives them security, increases their bargaining power and enhances their status as land-holders in the village. Where the landless people belong to the Harijan* caste, this is an essential preliminary for the removal of untouchability itself. Existing disparities in ownership of land in agricultural incomes will, to a certain extent, be reduced. This will facilitate co-operation and rural progress and the State will have laid down the fundamental basis for the creation of a socialistic pattern of society" (p. 9).

There is one substantial argument advanced against the proposal to place a ceiling upon the existing land holdings, *viz.* that in order to be fair we should place a ceiling on non-agricultural incomes as well. Otherwise, we will be discriminating against the large owners of rural property and be guilty of a bias in favour of the urban rich. This argument, however, does not take account of the fact that, while man cannot create land, he can create other forms of capital. The large farmer has not added to the nation's wealth in capturing more land than ought to have fallen to his share, whereas the industrialist or the non-agriculturalist property-owner has, in putting up a factory or a house, created something which did not exist before. Secondly, it is land that in our conditions is a limiting factor while, of the two factors of production with

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* It may be stated here that not all Harijans are agricultural labourers or landless. For example, in Uttar Pradesh, according to the census of 1951, 60.9 per cent of the Harijans are cultivators of land or farmers, and 17.2 per cent agricultural labourers (the corresponding figures for the entire population being 67.4 and 5.7).

which the non-agriculturist deals, labour is surplus to our needs and capital, though wanting in the measure we need it, is after all not so scarce as land.

The Committee on Tenancy Reform set up by the Planning Commission's Panel on Land Reforms has the following observations to make in this connection—

> Monopoly in land and the ownership of large areas by a small minority of the agricultural classes is an obstacle to economic development. This does not apply with equal force to industrial development where large-scale organisation may lead both to greater economy and efficiency. Besides, redistribution of land is a simple operation as compared to changes in the much more complex organisation of industry and commerce. Historically also, redistribution of land, in a number of countries, preceded economic changes in the industrial sector (Report: p. 42).

The governing principle of redistribution of land should, perhaps, be that none is allowed to possess an area of land which under our technique of farming is beyond the capacity of an average man or worker to manage and none possesses less than an area below which, howsoever more labour may be applied to it, land will not produce more per acre. That is, the upper limit of the farm shall be governed by the capacity of one unit of man-power and the lower limit by the capacity of one unit of land. A reference to table No. I at page 29 will show that, as more and more men work a given land area, that is, as area per man decreases, production per acre increases with such great strides that production per man also increases, till land per man is reduced to a point between 33.3 and 25 acres—say, 30 acres. Four men with hundred acres between them are found to produce more per man than three men with the same area. Below 30 acres, with increase in the number of men, production per man begins to fall off, although production per acre continues to increase till land per man is reduced to a point between 2.6 and 2.1 acres—say, 2.5 acres. So that if the area a man possesses amounts to more than 30 acres, neither land is fully utilised, nor labour because of its dispersal over too large an area gets its full return, and if it amounts to less than 2.5 acres per worker labour is not fully employed and goes waste. At these stages, that is, when the above level of 30 acres and the lower level of 2.5 acres per man have been passed, both individual and national interests coincide and suffer equally. In between these levels, the more land a man or an agricultural worker has, the better for him, for its total production will rise with every acre added to the holding; the less land he has, the better for the country, for the country's total production will rise with every acre taken away from the holding.

Therefore, it is in the interest of the nation *and also in the interest of the farmers concerned*, if excess land is taken away from all those families which possess more than 30 acres per worker, and distributed to those which possess less than 2.5 acres per worker. Also, laws relating to transfer and partition of land should be so amended and enacted that no holding of less than 2.5 acres per worker comes into existence in the future. The Committee on Tenancy Reform set up by the Panel on Land Reforms is also of the view that "peasant farming can be stabilised only if provisions are made to ensure that units of management do not decrease below a minimum size."[1]

In order to determine the area of land a family may be allowed to retain, we will have to look to its labour resource. Indian agriculture has a labour force of 41 per cent so that an average farming family of five persons has a labour force of $\frac{5 \times 41}{100}$ or 2.05 men-equivalents. Therefore, for an average family land-holding, we arrive at a ceiling of (30 x 2.05 =) 61.5 acres and a floor (2.5 x 2.05 =) 5.125 acres. But, inasmuch as, compared with the family of a large farmer, the family of a small farmer has a lesser tendency to disintegrate and its young and old members, including women, lend a greater hand to work in fields, and, inasmuch as, therefore, its labour resources are greater, it would, perhaps, be more correct to place the floor at 6.25 acres which just make 10 standard bighas (requiring 2.5 men-equivalents to work it at maximum intensity) and the ceiling at 60 acres.

There may be other criteria to determine the floor and the ceiling, depending upon the preference of an economist or a government concerned, or what ideas an authority holds on 'social justice'. The Size of Holdings Committee set up by the Panel on Land Reforms has suggested that the ceiling be placed at three times a family holding—the latter being defined as land held by an average family of five persons which brings a gross income of Rs. 1,600 per annum. A family was deemed to consist of husband, wife, unmarried daughters, dependent sons and grand-children. One additional family holding was to be allowed for each additional member subject to a maximum of six family holdings.

This definition of a family holding, however, is not very satisfactory. It speaks of three determinants, *viz.*, income, size of family and its cultivating capacity. Income from land cannot be a reliable guide, for it will depend upon the type of farming, the locality, and somewhat upon the ability of the farmer. Also, it is likely to differ almost every year with the quantity of production and with prices,

[1] Report of the Committee on Tenancy Reform, p. 48.

both of which, in their turn, depend on so many factors that are beyond the control of an individual. Nor is the size of the family a safe criterion. One man may have three minor daughters, and another three adult sons who are still living with him. A young man and an old man may have families of an equal size to-day, but, in course of time, the size of the young man's family is likely to increase. A family holding may, therefore, better be defined solely with reference to the area that an average family may fully exploit. Besides land, there are two other factors of production, *viz.*, labour and capital without which it cannot be worked. It would, thus, be rational to correlate the area of a family holding with the labour resources of an average peasant family and its minimum capital requirements, so that full use of all the three economic factors throughout the year is assured. Now, an average family has two workers, and the minimum capital it requires is a pair of two bullocks. So that a family holding should have an area that may provide continuous employment for two workers and two bullocks. Inasmuch it is economic factors that determine its size, the holding may also be called an economic holding. Strictly speaking, the area of such holding also in various regions of the country will differ with the kind of soil, the nature of crops grown, the availability or otherwise of irrigation facilities, and the performance of the bullocks, but almost all these factors are remediable. For, in most cases the soil can be improved, the cropping pattern changed, irrigation facilities provided where they did not exist to-day and, where the bullocks are of poor quality, two plough-units may be allowed instead of one.

It must be conceded that in this respect, namely, the attainment of the objective of equitable distribution, a system of collective farming, if not that of co-operative farming, scores over an economy of small farms, where disparities in economic status, although greatly reduced, will still remain. It is a different matter, though, as there are various grades in men's capacities, difference in their economic conditions also should and will always remain. According to a decree of the Council of Ministers, dated April 19, 1948, there are nine classes of workers on a Soviet collective farm, ranging from the president, senior tractor-drivers, etc., who are credited with two to five labour-days for each day actually on duty, to watchmen, cleaners, etc., who score only half a labour day for every day on duty.

CHAPTER IX

MAKING DEMOCRACY A SUCCESS

We have deliberately chosen a democratic way of life. Inasmuch as we have emerged into a full-fledged democratic state after centuries of colonial and despotic rule, which has demoralised our people, we have to take special care and special pains to see that the democratic spirit is fostered in our society at every step. All schemes that we frame in the social, economic or administrative sphere have to be tested on the touchstone of democracy, *viz.* whether or not they will serve to strengthen the democratic tendencies, inculcate democratic modes of behaviour and generate an atmosphere of personal freedom and initiative. Those which do not serve these purposes have to be assiduously eschewed as a matter of national policy. The care and guardianship of this tender plant of democracy becomes all the more incumbent on us in view of the circumstances in which our country finds itself in the East—almost a lone standard-bearer of parliamentary democracy amidst a crowd of nations which either do not understand democracy, or have notions on it far different from ours, or are just struggling to find their feet consequent on the retreat or impending retreat of western colonialism from the region.

It is the individual who forms the base of democracy. It is he who as a voter chooses who will run the village panchayat, the State Government, or the Union Government for him. He should, therefore, be able to form a judgment or take a decision on his own responsibility, untrammelled by any restrictions or apprehensions. Now, it is axiomatic that a man who is not free in his economic life or who is dependent or leans on somebody else for his bread or has to take orders from others all the twenty-four hours of the day, cannot develop an initiative. He will have his personality cramped and, what is the crux of the matter, will not be free to act, much less vote, as he likes. So an economic system in which the individual is not free, whether he works on land or in industry, will ultimately work out to the detriment of democracy. Political and economic freedom are interdependent—'you cannot have one for long without the other'. In that society alone will democracy, in the true sense, be a success where the individual, the bread-winner, is the master of his tools or means of production. There he does not have to take orders from, or render account to, anybody or any group or association of individuals, in fact, any authority outside

of himself. But he is the sole captain of his fate free to regulate his conduct as best, or, even as worst as he likes. That is what Mahatma Gandhi taught us; that is the message of the *charkha* on which he laid so much stress.

We have now to decide which of the three alternatives set out in Chapter II will fulfil our purpose. In our opinion, it is the economy of small farms, again, which happens to be the answer. Not only does it produce more wealth and provide more employment, but it also removes glaring disparities from land and will also prove the most secure base of democracy. The liberty of the worker—a condition precedent to successful functioning of democracy—varies inversely with the size of the undertaking in or upon which he is employed. An economy of large private farms or capitalist farming envisages a rural scene where the number of persons who will give the orders, *viz.* the farm-owners or managers, will be very few and the number of those who will carry out these orders, *viz.* labourers, will be very large. For example, if we divide or distribute the arable land of Uttar Pradesh into farms of, say, 50 acres each, we will be left only with about eight to nine lakhs persons or families of land-owners, and the rest, say, some eighty-five lakhs of families of divested peasantry, will be added to farm labourers, who already count more than eight lakhs of families. In such an economy of large undertakings a few will get the whip-hand, who will develop, because of the nature of their business, an imperious attitude hostile to equality and freedom and who will gradually come to dominate the political life and the administration. While the vast majority, accustomed always to receive and obey orders, free though nominally, will not count either in social life or counsels of the States and the Union.

Under the Weimer Republic, concentration of large estates in pre-war eastern Germany, where a group consisting of three per cent of the population owned 20 per cent of land and was roughly characterised as *junkers*, resulted in a feudal society of poorly educated, poorly paid, and ill-housed farm labour population and in educated and powerful land-owning 'elite'. This group formed the kernel of social and political 'reactionary-ism' in Germany. The majority of the *junkers* supported and encouraged all movements at the overthrow of the Republic. They were consistent and active opponents of democratic government.

A proposition of an economy based on large, private farms has, therefore, only to be stated in order to be rejected, and we need not tarry long over it.

Now, as regards the co-operative farm which will be a big

economic unit with hundreds, sometimes thousands of workers working under one direction or management—Will such an organisation ensure freedom to the individual or full expression of his personality? Will a society based on large mechanised undertakings produce self-regulated individuals who are the first postulate of democracy? No, it cannot. Any large undertaking in which a large number of persons form one unit must necessarily be regulated by the State and can efficiently be run only on the basis of planned management. There is, therefore, an inherent tendency for more and more bureaucratic interference and control. Whether we take the case of the Russian *kolkhoz* or the Chinese producers' co-operative, the degree of control, apart from the manner in which it is exercised, which the State has necessarily to apply to keep these organisations functioning, shows unmistakably the futility of imitating them in a democratic set-up.

In the USSR, the state through the State Planning Commission assisted by the Rayon and Provincial Commissions, lays down a production plan for each farm containing directions about the acreage to be put under different crops. It also decides how and when labour shall be applied, the agronomic measures the *kolkhoz* must apply, the amount of gross revenue that should be saved, that is, reinvested in means of production, and so on. The only freedom that a *kolkhos* enjoys in this regard is to decide matters of purely domestic nature, such as proportion of the surplus produce to be sold, the proportion to be distributed among its members and the percentage of the net revenue to be set aside for communal purposes, such as club-rooms and creches.

The measure of the external control to which the *kolkhosy* are subject in their day-to-day working can be realised from the fact that, apart from the internal accounting a *kolkhoz* has to render, it has to submit, at least, eleven returns at intervals ranging from days to six months to the Commissariat of Agriculture, showing the progress of field work, the state of crops, sowing and harvesting operations, etc.

In addition to the production plan and all it implies, the State lays down a rigid price policy for the greater part of the marketable produce of the farm. Every *kolkhoz* is compelled to deliver to the State its quotas or fixed quantities of grain and other crops and meat per unit of cultivated land to the amount laid down for each region, for which it receives payment at the State purchasing price, nominally based on the cost of production. The prices paid are, however, extremely low in comparison with prices of manufactured goods bought by the peasant or the open market prices for the same

for. With the producers' co-operatives, the State will have to deal alternately with less than half a million co-operatives which will become the organ of the State in implementing its welfare programmes" (p. 134).

The liberty which its members enjoy as individuals is even less. We shall quote again from the Report of the Krishnappa Delegation:

> Each production brigade consists of a number of working teams ....The management committee appoints the leaders of production brigades and of working teams....A supervisory committee is also elected by the general meeting or by delegates elected by a general meeting, its functions being to see that the chairman and members of the management committee abide by the regulations of the co-operative and the resolutions of the general meeting, that the accounts of the co-operative are in order, and that there is no corruption, theft, sabotage, waste, or damage to the co-operative's property. The chairman of a co-operative is a person with much power and responsibility as he 'represents the co-operative in its dealings with other parties'.....there are considerable reserve powers, especially with the leaders of production brigades and with members of the management committee, through which failures in team work, lack of application and indiscipline can be dealt with ....To put the piece-work system into practice each co-operative has to decide upon suitable norms for various jobs and to fix rates of payment.....The number of work-days a member earns for fulfilling the norm for each job is decided on the basis of the skill and intensity of labour involved and the importance of the job to the production of the co-operative as a whole (pp. 115, 116 and 117).

Election of committees and office-bearers has to be made from names given by the Communist Party. Translated into capitalistic terminology the farmers become wage-earners with the same widely varying wage-scales as the factory workers and with the same subordination. With this difference that a man not fulfilling the norms would not merely get less remuneration for less work, but would actually be punished. The Delegation sums up by saying—

> It is not improbable that in many co-operatives there exist doubts and criticisms to which there may or may not be satisfactory answers. It is not easy for a visiting delegation to grasp such elements in a new situation in which large numbers of men and women are thrown together rather suddenly in a complex set of social, economic and organisational relationships such as a large agricultural co-operative represents (p. 118).

In his voluminous study of Soviet agriculture Naum Jasny comes to the conclusion that the contrast between theory and practice is most flagrant. Instead of voluntary participation there is coercion; instead of democratic decisions by the General Assembly there is dictatorship of officials who themselves are only small cogs in a big administrative machine. There is a tendency to shirk duties,

to defraud the group for the sake of personal gain, and instead of a spirit of partnership the actual state of affairs makes the 'analogy to serfdom' increasingly justified. Jasny concludes: "the misnamed *kolkhoz* is the nutshell of a co-operative without the nut". The same is true of the Chinese venture in the field of co-operative farming.

The truth is that economic motives are only secondary. All the motive power comes from the social theory that the peasant is a capitalist and must, therefore, be uprooted from his land, eliminated as an independent unit and reduced to a proletarian, for otherwise he will remain a potential source of internal opposition to the Communist regime.

David Mitrany says:

> Pure Marxists were moved much more by political needs than by scientific arguments, and even less by any understanding or sympathy for the countryside. The Communist Manifesto had lumped the peasant together with handicraftsmen and small traders, etc., in the 'petty bourgeoisie' as an unstable and reactionary class and never thought of allotting him a place of his own in the revolutionary procession. If one considers not only *Capital* but his whole scientific and political activity, nowhere will one find signs that Marx had seriously studied the actual state of the peasants in any one land. His way had been to formulate a general theory and simply sweep them into it, never considering them as a subject fitted for a special plan or reform. It was a sentence without a trial. All his life, not only as an economist, but also as a townsman and a revolutionary, Marx was filled with undisguised contempt for the peasant *(Marx Against the Peasant*, 1950, pp. 40-41).

None of the top leaders of the Russian Revolution who forced the co-operatives upon the peasantry, had a peasant origin or any connection with the village. They belonged to the intelligentsia or the proletariat and were, therefore, unable to appreciate peasant needs, and entertained no sympathy for peasant longings. The same is true of most of the ardent supporters of joint farming in India.

The aim of Communism is to gradually convert the independent peasants, through the system of collective farms, into a landed proletariat. Everywhere it has climbed to power on the backs not of capitalist buorgeoisie which did not exist, or were insignificant but on the backs of the working peasant masses. It first encouraged the peasants to help themselves to land, only so that it might have its hands free to grasp political power, and then used that power to deprive peasants of land.

To implement this scheme, the Soviet Government sent out 25,000 industrial workers into the country in 1929 to become the first *kolhozi* presidents. An equal number of members predominantly belonging to the urban proletariat was again despatched into

the country in 1933 who were distributed among more than 5,000 political centres to exercise political supervision over the attached *kolkhozy*. According to an announcement in the *Pravda*, the Soviet leaders decided as late as in April, 1955, that a 'shock brigade' of 30,000 city-trained specialists, or 'experienced workers' was to be sent into the countryside within the next four months to 'ensure the guidance of agriculture'. These men were to be 'recommended' as chairmen of those collective farms where weak leadership was responsible for inefficiency and shortage in output. It is almost superfluous to say that these specialists were chosen for their loyalty to the Party and their Communist single-mindedness, and not for their knowledge of agricultural conditions. It is these 80,000 persons who were the forerunners of a class of professional presidents and other functionaries who to-day rule the *kolkhozy*. It is these 80,000 persons and other technical personnel drawn from the town who assumed the leadership of the village: very few presidents of the *kolkhozy*, indeed, were local men or men of rural origin.

To quote again from the report of the Krishnappa Delegation in regard to China: "No less important than these technical and economic considerations was the view held by the leaders of the Communist Party that a socialist society could not be built up unless co-operative farming took the place of peasant proprietorship and step by step all vestiges of individual ownership in land were discarded. As they put it, 'the nation could not stand with one foot on socialistic industry and the other on a peasant economy'. Or, in the words of Chairman Mao Tse-tung, 'if positions in the countryside are not held by socialism, capitalism will assuredly occupy them'.... It was for these various reasons that the Central Committee of the Communist Party declared a year ago that—

> The aim of the co-operative movement is to lead about 110 million peasant households from individual to collective farming and then go on to bring about technical reform in agriculture; it is to eliminate the last vestiges of capitalist exploitation in the rural areas and establish socialism. The building up of socialism is the cause of hundreds of millions of people (p. 107).
>
> The Communist Party and its cadres at all levels have played a fundamental role in the organisation of producers' co-operatives as they did earlier in land reforms. They provide the core of the organised effort in every local community and in the future also the success or failure of co-operatives will turn largely on their performance, behaviour and leadership (p. 190).
>
> But behind this organisation of the Chinese farmers into co-operatives and the mobilisation of the resources of the entire nation, there is a force which should not be lost sight of. It is the Communist Party of China which has 10.7 million well-organised, disciplined and hard-working members. It is the members of the Party

> working in the remotest villages who have brought about a fundamental change in the rural structure of China within a short period of seven years. It is also these party members who provide the necessary drive for increasing production and ensuring that the targets are fulfilled. There are writers on China who have spoken of the ruthlessness which might have marked the early phases of the new regime as a factor in the subsequent transformation from individual to co-operate cultivation. This may or may not be so, but we cannot comment on the suggestion from our own direct observations (pp. 191-192).

It is abundantly clear from these observations that the motive power for the Chinese co-operatives comes not from the Chinese farmer but from the active members of the Communist Party. Comparing the conditions with India the delegation observes:—

> In Indian villages in areas where development programmes are undertaken and the right kind of leadership is forthcoming, there is, perhaps, more voluntary effort, local initiative and general awareness than we were able to observe in China (p. 192).
>
> There may be a view that in China the rural leaders lack flexibility and depend more on directions from the party as well as from the Government than on their own initiative or on the support of the local people. If this occurred, they would not compare favourably with rural leaders in countries with a long history of economic development on democratic lines, and in the long run this may prove to be a serious handicap and may limit the degree of technical as well as social progress which is achieved by the rural population (p. 191).

No fundamental reform can be divorced from ideological considerations. The ideology which has been responsible for the phenomenal growth of what is called co-operative farming in China has been deliberately rejected by us. Can we transplant a seedling which has been sown, tended and nourished in a communist climate into our climate of fundamental freedoms? As observed by the Krishnappa Delegation on page 43 of its report: "The system of Communism in China, however it may have been adapted to the needs and conditions of Chinese society, does not, of course, provide for freedoms such as those of information, expression and association in the manner familiar to us in India. In this sense, it shares inevitably several typical political features with communist countries in the west." In the concluding sentence of its report the Delegation rightly cautions us thus: "We must emphasise, however, that any measures that we may adopt for economic development or technical progress should be fully in accord with our democratic institutions" (p. 199).

How the thinking of advocates of co-operative farming in this country is confused is well illustrated by a correspondent of a New Delhi newspaper dated June, 1957:—

In India democratic socialist thought has yet to define its attitude to the small peasant clearly. Remnants of the archetypal Marxist-Leninist theory of the small peasant's doom, largely irrelevant in the context of India's man-land ratio, mixed with a genuinely democratic concern for the small peasant, produce a schizophrenic policy bristling with contradictions. Yields can be greater on small farms than on large farms and yet we regard an enlargement of the scale of farming operations as a pre-condition of increased output. We know that the small peasant is not an exploiter and yet we would treat him as a 'capitalist'. We wish to help the small peasant but we continue to believe in his doom. We know that in our peasant democracy the small peasant must predominate and yet it is for his proletarianisation that we work. Our administrative and co-operative structure has yet to prove equal to the supreme task of redistributing land and carrying enough resources to the small farmers, but we are already dreaming that it will soon co-operativise a substantial proportion of agricultural lands. We know how attached our peasants are to their holdings and yet we desperately wish to believe that they will pool them 'voluntarily'.

It is high time we—all of us socialists now—come down to earth and squarely face the problems of the small peasant and give him what he needs, before delivering our *ex-parte* judgment that he cannot deliver the goods, unless we run him as a wage-labourer in a huge collective. The small peasant is not a person to be disposed of by starry-eyed logic; he is a harassed human being to be understood and helped to help himself and to feed us. If we, who feed on him, mistreat him, collectivise him and write him off, inspite of the unprecedented peasant franchise that characterises our democracy, the results can only be fatal. Indian socialism must be for the small peasant, not against him.

A society based exclusively or overwhelmingly on big economic units, whether in the field of agriculture or of manufacturing industry, must inevitably lead to concentration of power in the hands of a few. The larger the size of an undertaking, the less the active participation of the members or workers in its affairs and fewer the opportunities for office-bearers to come into direct contact with them. This will affect the understanding of the members about the problems of the organisation and there will be a danger of decisions being taken by the few which may not be in its true interest. Ordinarily, majority of the people have little time and little inclination to think and learn all the facts necessary to make wise decisions on public affairs of a large institution. They prefer to follow someone else who is willing to think or in a position to think. So, in large matters people must delegate decisions to a relatively few representatives. "A society based on big economic units leads", said Acharya Kripalani, "to bureaucratic and dictatorial exercise of power. The rulers in that case not only regulate the political but also the economic life of the people. If political power has a ten-

dency to corrupt the holders of power, this tendency is doubly increased by the combination of political and economic power in the same hands. Capitalism killed democracy because the capitalist class wielded, directly or indirectly, political power. Communism puts in the hands of the political dictator and bureaucrat the entire control of economic power. Herein lies as great a danger to democracy as under capitalism.

Therefore, if democracy is to survive, it must discover a means of avoiding concentration of economic power in the hands of the ruler or rulers, however selected or elected. Even a political democracy can be a dictatorship if there are no spheres of free activity left to the individual".[1]

The plant of freedom cannot thrive on the soil of collectivised farm which is a large joint undertaking, nor was it intended to thrive by its founders. When we find in India, therefore, persons who profess belief in democracy yet advocate establishment of huge, jointly-operated units of production as the remedy of our rural problems, one can only sympathise with them and wish they knew the country-side and the object of their arm-chair solicitude before offering solutions. No lover of the peasantry and the country would be enthused by the prospect when our countryside will be turned into huge barracks or gigantic agricultural factories. Such an economy would enslave the people and take away their freedom which is material to all definitions of happiness. It is doubtful whether there is any advantage in a powerful and prosperous State if it is to be achieved at the expense of human freedom and happiness.

In a speech in New Delhi in the early half of 1955 the Prime Minister said that "India is trying to achieve economic prosperity without abandoning democratic institutions and would not sacrifice democratic institutions at the altar of economic progress". He went on to add that "in the long run, economic prosperity based on a denial of human freedom and dignity could not carry a country far", and that progress had been achieved in Russia "at the cost of the freedom of the individual".

"I think that in the long run", observed the Prime Minister, "the democratic and peaceful method is more successful even from the point of view of time and much more so from the point of view of results".

Whatever emphasis may be placed upon the differences between a co-operative farm and a collective farm, so far as internal working is concerned there is, and there can be, no difference. Land, labour and capital are pooled in both and, the size being large,

[1] Presidential Address delivered by Acharya J. B. Kripalani at the 54th Session of the Indian National Congress in November, 1946, in Meerut.

they cannot be managed without a plan and without orders issuing from some central unified authority. In both, the peasants will have to be assigned to brigades and the latter divided into teams, individual work evaluated, a complex accounting system adopted, a code of punishments provided, and so on. To the extent—and this extent will necessarily be large—the peasant, the member of the farm, is not free to obey his own desires, his liberty is curtailed; he is not independent. And to that extent democracy in the land will suffer.

It is true that some control of the individual is inherent in all organisations, and that organisations—social, economic and political—are essential to all civilised existence. It is, therefore, on the degree of control that the question turns. *That society is best where control over the individual is the least.* Such is a society of small autonomous organisations usually consisting of a family, both in the sphere of agriculture and also, as far as we can help it, in the sphere of industry. Large organisations, because of their nature, are inevitable in some branches of manufacturing: they are not at all necessary in the sphere of agriculture.

A system of agriculture based on small enterprise, where the worker himself is the owner of the land under his plough, will foster democracy. For, it creates a population of independent outlook and action in the social and political fields. It is true that the peasants have to earn their living the hard way: only a few are able to accumulate a surplus. They may be conservative, but will not be reactionary; they may be in favour of a private economy, but are not exploiters, either. The peasant is an incorrigible individualist; for, his avocation, season in and season out, can be carried on with a pair of bullocks in the solitude of Nature without the necessity of having to give orders to, or, take orders from anybody. That is why the peasant class everywhere is the only class which is really democratic without mental reservations. The system of family-size farms ensures stability because the operator or the peasant has a stake in his farm and would lose by instability.

Peasant farming also makes for a happy community and a satisfied individual. Security to the peasant owner is a matter of course. "To own the land and to be free to farm it in the traditional peasant way is to him nothing less than the equivalent of that 'social security' which has become the aspiration of industrial masses even in the advanced countries of the West. The life-line which in the west the State has to throw to the worker whenever he is in difficult circumstances, through the complex of insurances against unemployment, against sickness and want, for old age and so on, the peasant has always found in his traditional economy. As Miriam Beard says in her *History of the Business Man*, discussing his part through many

centuries, 'men suffered on the land but survived; while in the cities they flourished—and faded'. The peasant's way to security may not provide him with such great material benefits as those now given in the West by the State, but it is a security which he can achieve with his own hands and which leaves him free to stand on his own feet".[1]

Inasmuch as the character of political institutions was determined by the fundamental laws respecting property, Jefferson, one of the architects of American democracy, firmly believed that a wide dispersion of private property—a wide diffusion of rights in land which make for individual freedom and creative individualism, and an opportunity to acquire such rights—was essential to the establishment of democracy and the safest assurance that it would endure. When the individual possesses nothing which he can call his own, he has precious little freedom of action (even in his most trivial actions).

F. C. Howe states:

> Farm ownership and the small farm are the economic bases of Danish life. To these economic conditions other things are traceable. The kind of land tenure that prevails is the mould of the civilisation of a State. This is true of nearly all countries. It is hardly a coincidence that wherever we find hereditary landlordism, as in Great Britain and Prussia, there we have political reaction. There is, so far as I know, no exception to this rule. It was this that explained old Russia. It was land monopoly that lay at the back of the Irish question and the long-continued poverty of the Irish people. On the other hand, wherever we find the people owning their own homes and cultivating their own land, there we find an entirely different spirit and a different political system. With ownership we find democracy, responsible government, and with them the hope, ambition and freedom that prevails in France, Holland, Switzerland and the Scandinavian countries. For these are the countries where the people, rather than the old feudal aristocracy, own the land.[2]

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[1] David Mitrany, p. 130.
[2] *Denmark: A Co-operative Commonwealth*, 1922, p. 71.

CHAPTER X

IMPRACTICABILITY OF LARGE-SCALE FARMING

The number of persons holding cultivable land in India is vast: it was 19,89,86,000 or 56 per cent of the entire population in 1951. The corresponding figures for Uttar Pradesh stood at 4,26,07,000 and 67.5 respectively. In the context of these figures a pertinent question is whether large-scale farming as a method for general adoption in this country is really practicable.

Quite apart from the merits of the proposal, it is simply not possible for any democratic government to divest these people of their lands with a view to set up an economy of large farms. The psychology of the peasant will have to be considered. Habits centuries old are not changed in a day, and habits rooted in the soil are with difficulty changed at all. A large collective undertaking may be well adopted to the needs and mentality of the agricultural or industrial labour, but not one tenant in a hundred or one owner in a thousand wishes to be turned into a collectivist as long as he can make a living, however modest, on his farm. He is too tenacious of his independence and, if an owner, too attached to his land and too jealous of his social prestige. In membership of a co-operative or collective farm he sees a loss of all the three—his land, independence and prestige.

Attachment to the land is a universal trait in the peasantry of all countries. The French peasant, for instance, calls his land his 'mistress'. Here is an extract from a French author, Michelet, which truly depicts a peasant's passion towards his land:

> If we would know the inmost thoughts, the passion, of the French peasant, it is very easy. Let us walk out on Sunday into the country and follow him....I perceive that he is going to visit his mistress.
>
> What mistress? His land.
>
> I do not say he is going straight to it. No, he is free today, and may either go or not. Does he not go every day in the week? Accordingly, he turns aside, he goes another way, he has business elsewhere, and yet he goes.
>
> It is true, he was passing close by; it was an opportunity. He looks but apparently he will not go in; what for? and yet he enters
>
> At least, it is probable that he will not work; he is in his Sunday dress; he has a clean kerchief and blouse. Still, there is no harm in plucking up this weed, and throwing out that stone. There is a stump, too, which is in the way; but he has not his tools with him he will do it tomorrow.

> Then he folds his arms and gazes, serious and careful. He gives a long, very long, look, and seems lost in thought. At last, if he thinks himself observed, if he sees a passer-by, he moves slowly away. Thirty paces off he stops, turns round, and casts on his land a last look, sombre and profound, but to those who can see it, the look is full of passion, of heart, of devotion.

Human nature is the same everywhere. Here, our peasant calls his land *Dharti Mata*—Mother Earth—inasmuch as it provides sustenance for all living things.

Everywhere the peasant is a firm believer in property striving for independence. Hence a collectivist economy will meet with his emotional resistance from the start. Ultimately it is not a question of economic efficiency or of form of organisation, but whether individualism or collectivism should prevail. Peasantry represents not only a certain form of economy but also a certain way of life. Within the peasantry those characters, traits and moral forces are most pronounced which resist the tendency towards collectivism and of being levelled down into a uniform mass. On the other hand, the co-operative idea of self-help by voluntary association which does not efface economic independence appeals to peasants. It is significant that communists try to overcome the individualistic thinking of peasants by using co-operative slogans.

Any government with democratic pretensions, run by any political party whatsoever, which attempts to establish an economy of large farms, will either founder in the attempt never to recover, or, will turn dictatorial in the process. Constituting a majority of the total electoral strength as they do, the peasants cannot, even if all other sections of population combine against them, be coerced into accepting a course against their will. That is why in every instance the Marxist agrarian programme has had to be applied by force and to rely on force for its survival. The socialists who wanted to remain democrats had, in every instance, to abandon the programme.

The advocates of collectivisation commit the mistake of appraising India in terms of the psychology and the living conditions of old Russia and do not make an allowance for 'differences in political experience, social background and emotional response'. Possession of land had been in some sense joint and communal throughout Russian history. The *mir* or the *commune,* in which the village communities were organised, was a distinctive and peculiar attribute of traditional Russian civilisation. The characteristics of communal land-holding were:—

(1) Distribution in strips,

(2) Compulsory adherence by all members of the commune to a common rotation of crops,

(3) Temporary occupation by the individual of his allotment, and

(4) Periodical alterations in the size of the allotments.

The coming of the *kolkhoz* is, therefore, a purely Russian event that must be seen, understood and evaluated as such. "The *kolkhoz* is the collectivised farm emerging out of a primitive peasant economy", says G. D. H. Cole, "which had neither wholly lost nor forgotten the collective characteristics of serfdom and feudalism. It could not be developed out of a system of middle-sized tenant farms, such as existed in Great Britain, or out of a developed and civilised peasant proprietorship like that of France, or again out of the homestead farming characteristic of the United States and Canada" (Vide *Practical Economics*, 1937, pp. 49-50). Nor can it emerge, in our opinion, in India where individual ownership has a very long history and is deeply rooted in the consciousness of the peasantry.

The idea of peasant ownership came to the fore in Russia only in the latter half of the last century. It was after a long agitation beginning with the Emancipation Act of 1861 that on November 22, 1906, an ukase was promulgated depriving the *mir* of its authority and giving the peasants a right of separation from the commune, which laid the foundations of a class of true peasant proprietors. In 1928, therefore, when the Government of the USSR embarked on compulsory collectivisation, peasants whose ownership of land had some history behind it, were a small fraction of the entire peasantry, *i.e.* 10.7 per cent, the vast majority having come into ownership (a fact never openly recognised by the Communist Government) only in 1917 when the big landlords, the church and the crown were liquidated. Nevertheless, collectivisation was bitterly resented by the peasants as a class even in Russia who had some day hoped to enjoy the land in individual ownership as a result of the Revolution.

Some of the believers in collectivisation may, perhaps, like to argue that the desired end can be brought about by persuasion and that, provided the necessary propaganda, education and demonstration are forthcoming, the peasants can be converted to a voluntary acceptance of collective farming. So far, however, the experience of the USSR, Yugoslavia and other eastern European countries tells a different tale.

While, on the one hand, propaganda as a result of a resolution of the Fifteenth Party Congress held in December, 1927, which decided upon collectivisation, was unleashed by the Soviet Government in 1926 for popularising the *kolkhozy*, and a few collective farms were set up to serve as demonstration, the Government introduced, on the other, a so-called contract system under which an in-

dependent peasant was bound to deliver to Government grain-collecting organisations the whole of his surplus harvest at the price fixed by the Government. It was the Government collecting agency itself which decided what quantity of grain was surplus to the needs of a particular peasant. In case a peasant or *kulak* failed to deliver his quota, his grain was confiscated under Article 107 of the Criminal Code and 25 per cent of it made over to the poor peasants of the village. All these measures and other restrictions, however, failed to attract the peasant into the *kolkhoz*. He remained unconvinced of its superiority, with the result that during two years from the spring of 1927 to the spring of 1929, percentage of peasant housesteads collectivised rose from 0.8 to 3.9 only. In January, 1930, therefore, the Central Committee of the Communist Party took a most decisive turn in policy. It resolved to eliminate the *kulaks* as a class by wearing down their resistance in open battle and depriving them of the productive sources of their existence and development (the free use of land, *viz.* the means of production, the renting of land, the right to hire labour, etc.). Instructions were issued that by coming spring 30 million hectares of land should be brought under collectivisation. This was about 25 per cent of the total area under crops in 1929. Peasants labelled rich were *ipso facto* condemned to liquidation, and taxes far heavier in proportion to those borne by the other groups, middle and poor, were imposed on them; if they paid the first time, they were reassessed at twice or three times the original sum. Sooner or later the peasant failed to pay his taxes; thereupon, his property was handed over to the nearest *kolhoz*. Those who showed the least signs of resistance or gave cause for doubt or offence to the local party bosses, were liquidated or silenced by measures which are now part of history.

An attempt at coaxing the peasantry into collectivisation was made next in Yugoslavia, but it must be confessed that it was with the same disappointing results so far as the reactions of the peasantry are concerned. A movement to wean the peasants into collective farms was set afoot with open and covert official pressure, soon after the country had been liberated from the yoke of the Nazis in 1945. As against 3,500 collective farming societies started in 1949, in 1950 only 353 societies came into existence. With the relaxing of official pressure the movement evidently lost its momentum. In the summer of 1951 the total number stood at 7,000 comprising 22 per cent of Yugoslavia's arable land and 4,20,000 households. Signs of discontent began to grow in the older societies. Management was inefficient and the credits were expended chiefly on buildings. There were many applications to withdraw, over 2,500 in Macedonia and more than 3,000 in Croatia. The Communist Government, there-

fore, led by Marshal Tito decided not to force the peasants into collectivisation at the point of the bayonet, and it is this deviation from the orthodox communist policy that formed one of the major causes which led to the breach of diplomatic relations between the USSR and Yugoslavia. The Yugoslav parliament, on April 27, 1957, formally passed a resolution abandoning altogether the system of collectivisation. It pointed out that collectivisation had shown negative results—loss of interest on the part of peasants and decrease in production all round. The country is now committed to what is called 'socialistic co-operation'—co-operation between farmers farming their own private land on one hand and co-operative societies dealing with marketing and machinery on the other. On June 4, 1957, Marshal Tito declared in Belgrade that the Soviet-style 'forcibly formed co-operatives' in farming had not worked in Yugoslavia and this was why she had switched to a compromise between collectivisation and private enterprise. According to a recent report, hardly 500 collective farms were extant today.

Nor have the peasantry of East Germany, Czechoslovakia and Hungary taken kindly to joint or collective farming, efforts of the local Communist Governments and USSR, which holds these countries in its grip, notwithstanding. It is imposition of collective farms which is largely responsible for political unrest in the rural parts of these countries. Such farms, wherever they had been established, are now in the process of being broken up over large parts of eastern and central Europe.

> ....In Hungary the socialised sector in 1955 included one-third of the arable land area, with 1.3 million hectares in co-operatives and 700,000 hectares in state farms; but between October 1956 and January 1957 there was a 50 per cent decline in the area and number of co-operative farms. In Poland the rate of formation of co-operatives was slower than in other Eastern European countries By early 1956, the socialised sector comprised 23 per cent of the agricultural land area, with two million hectares, or 10 per cent in co-operative farms, and 13 per cent in state farms. Since the political events of October 1956, three-quarters of the co-operatives have dissolved. New policies, designed to increase output on peasant farms, and even to encourage land purchase, are now being introduced.[1]

According to press reports, Gomulka, the new Communist leader of Poland, in his first policy statement made at the Eighth Plenum of the PZPR Central Committee, on October 20, 1956, said that "in agriculture it is only the private sector which has prospered and that it was a mistake to collectivise the *kulak*." He told the Committee that "individual peasant production per hectare was

[1] An article entitled *Changes in European Peasant Farming*, by Doreen Warriner published in *International Labour Review*, November, 1957, p. 463.

16.7 per cent higher than in co-operative farms and 37.2 per cent higher than in state farms." He summarised his speech in the following words:—

> This is, in brief, an outline of the economic picture of co-operative farming. It is a sad picture. In spite of great outlays they had smaller returns and greater costs of production.

In an article, dated May 1957, on the alarming situation in the 6,000 state farms, General Ochab, the newly appointed Polish Minister of Agriculture, revealed "that in 1956 the deficit on the state farms amounted to £427,000,000. This was double the losses suffered last year. There was moreover no hope of any immediate improvement." The Minister ordered the dismissal of many hundreds of administrators and officials whose education and training had proved below the required standards. At the same time, the Government was presenting a new bill providing for the reorganisation of agriculture on the lines of 'peasant autonomy' suggested by Mr. Gomulka recently. This will give greater freedom to peasants of state farms, collectives and other types of farms to plan the running of them 'from below', and thus make them share more fully in the responsibilities of everyday management and profits. Individual farms, in particular, were to be given much greater encouragement, and the process of giving freehold title deeds to peasants on the land they cultivate was to be expedited.

This picture of the agrarian situation in Poland is true of what obtains in all the East European countries under the orbit of the Soviet Union. The tide is now beginning to turn again in favour of the individual farmers.

The collective farm or *ejido* is proving a failure in Mexico also. Its production per acre is far less than on individual farms and only very recently members have been given the right to break away from the farm and take to individual farming.

It is claimed that the agricultural producers' co-operatives had been a success in China. If so, one could naturally like to know, why was it necessary to convert and consolidate them into the 'advanced' or collective type of Russia? The professed goal of the Chinese Government, true to their communist philosophy, was collectivisation, and this can only mean that the Chinese Government themselves were not satisfied with the intermediate stage of co-operatives. Almost the same words, the same reasoning and the same technique which the Bolsheviks used in the USSR are being employed by their pupils in China. Chinese peasants, however, being what peasants are all the world over, these co-operatives, notwithstanding all the propaganda, could not have come into existence so suddenly as if by a wand of magic and are, without ques-

tion, a result of coercion. One can plan and, perhaps, also achieve physical targets at break-neck speed, but not targets which require or depend on progress in human consciousness to fulfil, as the organisation of co-operative farming does. With absolute political and military power resting in the hands of the Government, from which there was no escape and no appeal, the Chinese peasants, just as their brothers in Russia, had no choice, but voluntarily—'voluntarily' in the sense of the Communist dictionary—to opt or vote for the collective farm.

It was the utter poverty of the Chinese peasants which was exploited by the Chinese Government to fulfil its ideology. Says the Krishnappa Delegation to China on page 108 of its report ".... land reform in China meant an extraordinarily wide distribution of ownership in land. Altogether about 118 million acres of land were distributed among 300 million peasants, men and women, an average of one-third of an acre per head. Besides land, houses belonging to landlords containing about 38 million rooms, about 30 million draught animals, 39 million agricultural implements and about 5 million tons of foodstuffs were confiscated from landlords and redistributed. Many former landlords were allotted land on the same basis as tenants and labourers." Again, on page 109: "Agricultural co-operation followed naturally from land reform. Arrangements for state purchase of foodgrains and other farm products and the organisation of credit co-operatives closely linked with the People's Bank were important supporting developments. Together, they helped eliminate the rural trader, the urban merchant and the landlord, so that the ground was fully prepared for agricultural co-operatives." Still, again, on page 62, the Krishnappa Delegation has this to say: "We were told that there was no attempt to compel the Chinese peasants to join a co-operative farm. All that the Chinese authorities did was to carry on intensive propaganda and to regulate the Chinese peasants indirectly through sales and purchases and other controls and also through the monopoly of credit and to offer them other inducements for joining a co-operative farm. ....Price policy, technical assistance, provision of consumers' goods as well as producers' goods like fertilisers and, in some cases, contracts for purchase of the produce at a pre-determined price are the various means through which the Chinese Government is trying to make the Chinese farmers follow the planned pattern."

Shri R. K. Patil says in his reply to the dissenting minute to his delegation's report on pages 226-27:—

> ....Perhaps, State assistance was a powerful handle of attraction; and individual peasants who were not in the co-operatives,

> might have been discriminated. State assistance helped step up production of the co-operatives and attracted doubting peasants and many who were on the fence. This continued till the surging tide period, when there arose a mass movement for joining co-operatives. Thus persuasion, State assistance, examples of successful co-operatives, failure to get assistance as individual cultivators, and, perhaps, even discriminatory grain recoveries, operated as the main instruments for bringing the large masses of peasants in the co-operatives. And it is possible that some middle peasants may have joined co-operatives as they did not want to be in the group of landlords and rich peasants who were the last to be admitted. It will thus be seen that the great majority of the peasants joined the co-operatives voluntarily, i.e. without any compulsion or acting against their positive will.

It was against this background—a background created by giving everyone one-third of an acre, destroying the freedom of sale and exchange, and displaying unrelenting ruthlessness—that the Chinese peasant was welded into what is called the voluntary Chinese Producers' Co-operative. Shri Patil is welcome to his definition of 'voluntariness', but there will be many in this country who will differ from him. The theoretical freedom of the peasants to keep out of co-operatives is meaningless since it is impossible for them to function independently. The dissenting minute to the Patil Delegation's report says—

> Our colleagues do not see the evident contradiction between the professed principle of voluntariness and the simultaneous setting of high targets of the number of co-operatives to be established from year to year. How a 'voluntary' movement can progress according to the targets fixed by the State is something beyond our comprehension. We may here refer to a remarkable passage in Gomulka's famous report of October 20, 1956, in which he says, 'that a quantitative development of producers' co-operation cannot be planned, because on the basis of voluntary entry to a co-operative, this would amount to planning the growth in human consciousness, and that cannot be planned.' In the same report Gomulka says that the principle of voluntariness means not only threats or psychological compulsion but economic compulsion as well are excluded. Tax assessments and the establishment of the size of quota deliveries could also be an instrument of compulsion. (p. 200 of the Report)

Nor can these co-operatives yet be called a success in the economic sense. Sufficient time has not yet elapsed, nor are any reliable statistics available, to show that pooling of land into co-operatives has in any way contributed to increase in agricultural production. The Krishnappa Delegation to China clearly acknowledges that pre-war yields have not yet been attained.[1] China will, indeed, be fortunate if she can regain the pre-war yields and keep them up.

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[1] Vide p. 89 of the Report.

It was pure propaganda inspired by political considerations that was let loose on the world to the effect that as soon as China was taken over by Communism, food production went up by leaps and bounds and the offer, again inspired by political considerations, that China made to India of 50,000 tons of rice or so was cited as proof of the same. But what are the facts?

Mr. G. F. Alexandrov, leader of the Russian Delegation to the 41st session of the Indian Science Congress, told pressmen in Hyderabad on January 6, 1954—

> In 1950, Russia had begun implementing a five-year plan, which would be completed this year. The main feature of the plan was that side by side with the development of heavy industry, light industries and agriculture would also be developed. Russia was producing plenty of food-stuffs and was exporting a considerable quantity to *China*, France, Italy and other European countries (Italics ours).

In spite of the much-boosted rise in agricultural production in China, the prices of essential commodities continue to rule very high. The Krishnappa Delegation observed:—"But we noted that the cost of living in China was substantially higher than in India. For instance, at the time of our visit, the retail price of ordinary rice was Rs. 0-9-3 per seer in Shanghai, of wheat Rs. 0-9-9 per seer, vegetable oil for cooking Rs. 2-2-0 per seer, potatoes Rs. 0-3-6 per seer, peas Rs. 0-3-6 per seer, mutton Rs. 2-3-0 per seer, sugar Rs. 2 per seer, cotton shirting Rs. 4 per yard, cotton suiting Rs. 8 to Rs. 10 per yard, woollen suiting Rs. 45 to Rs. 50 per yard and shoes Rs. 30 to Rs. 40 per pair" (p. 41 of the Report).

China, with such dense population, will suffer far more grievously owing to this venture of their Government. The USSR had a vast area of culturable land, compared to her population, on which men and machinery could be employed. Mr. Aneurin Bevan, the left wing leader of the British Socialist Party, who himself had visited China as a guest of the Communist Government, said in a public meeting in Delhi on April 2, 1957, "that the failures of the Soviet Government in the field of agriculture were covered up by the opening up of virgin lands. These new fields provided a cushion to Soviet rulers." He went on to advise India that "she could not afford to make the mistakes that Russia had committed because she did not possess empty spaces which could be called upon to make up for the failures and mistakes of agriculture. She had to bring about an economic revolution in harmony with the needs of the countryside."

In the country of its origin, the Soviet Union, the *kolkhoz* or collective farm to which a co-operative farm is admittedly only an intermediate stage, is not regarded as the final, logical form of agra-

rian organisation. Before his death, in *Economic Problems of Socialism in the USSR,* Stalin foresaw* that the *kolkhozes* should become *sovkhozes* or state farms, which is to say that the bureaucracy should become their real owner. Criticising Stalin for his excessive use of purges, Khrushchev did not, however, renounce Stalin's views on property in *kolkhozes.* It will be a strange commentary on our wisdom that just when reports from the Soviet Union show that the *kolkhoz* has not given the results expected of it by its founders and the Communists are in desperate search of remedies and palliatives, our leadership is enthusiastically recommending the preliminary form, the co-operative farm, for adoption in India. There can be no manner of doubt that in looking towards the USSR or the People's Republic of China for a tenure pattern we are looking in the wrong direction.

In this connection we have further to remember that educated persons living in the towns have not been able to make a success even of the Co-operative Stores, or Consumers' Societies which were concerned merely with marketing. Nor are credit societies in the countryside yet a success in spite of so much time and effort that have gone into their organisation. Village panchayats, too, which are meant only to administer municipal functions or common lands, have run into difficulties and are posing a problem. This is so because they are elected bodies and election on the basis of majority and minority votes, not to create factions, requires largeness of heart which is rare among villagers and even well-educated townd-wellers. How much more difficult it would be to organise agricultural production, which is such a complex task, on a co-operative basis and through an elected management, in a community of illiterate and semi-literate peasantry, can, therefore, well be imagined. In fact, co-operative farming in the true sense of being voluntary, has not been a success anywhere in the world (except in Israel)—even where the farmers are cent per cent literate.

The initial success of co-operative farming in Israel is due to the peculiar situation which arose in connection with the requirements of Zionist resettlement. The abortive Russian revolution of 1905 brought to Palestine (then a part of the Turkish Empire) a number of young Russian Jews of some education, no agricultural or industrial experience, no private means, but of strong socialist convictions. Fundamental to these convictions was a belief in the immorality of employing labour. The exact form of the first settlements, and, in particular, the completely Communist society which

* In recent years there has been a relative growth in state farms at the expense of collective farms. Two of the reasons are that the state farm is ideologically more acceptable, and it produces more cheaply (especially now that higher prices are being paid to the collectives).

they evolved, thus owed something to the theories which the pioneers had brought with them to Palestine and something to their handicaps and environment—lack of means for individual settlement, lack of experience, and the need for mutual protection against a hostile Arab world. Something also may be attributed to their urban and intellectual background, which gave them interest and aspirations unlike those of the typical peasant. It should be remembered, too, that a great majority were, at that time, unattached young men and it was natural that their life should be modelled on the camp rather than the home. The Jewish refugees that trickled to these settlements, particularly, after the Balfour Declaration, had suffered prolonged persecution all over the world. United by this common distress, a common religious faith and a common desire to find a new homeland, they were determined to sacrifice all individualism for the sake of collective success of their new refuge. Also, the success of these settlements was greatly facilitated by the technical and other resources that the world Jewry placed at the disposal of the settlers.

Even so, the number of these settlements is not large. Only half a dozen successful collective settlements were founded under Turkish rule, though a few more, which failed after a struggle, were later refounded. Under the British mandate their number increased fairly rapidly. A score or more dating from the 'twenties' and the number increasing steadily through the 'thirties' and 'forties', till by 1950 there were in all 213 *kvutzot* or *kibbutzim* with 2,900 working members only and approximately 400,000 acres of cultivated land.

Problems have now begun to arise and multiply. The internal problems such as an increasing demand for personal comfort, lack of participation in the General Assembly, and a certain sense of frustration, particularly on the part of the women, are due partly to the social and economic solidification and partly to the growth in size of the settlements. From the establishment of the State of Israel and the requirements of unrestricted immigration stem such problems as loss of the most active members, tendency on the part of the state to interfere in the internal affairs of the settlements and disinclination on the part of the new immigrants to join the ranks of the *kvutza*.

Anyway, the Israel experiment can be regarded only as an extreme case which can hardly serve as a model for general application where similar conditions do not exist. We will have to make a distinction between the adoption of co-operative farming in new settlements and its introduction in old villages of the traditional peasant structure. Perhaps, there are no examples where peasants

in an existing old village have voluntarily given up individual use of their land, pooled it for joint utilisation and worked it as one undertaking for any considerable length of time.

The Planning Commission recently carried out a survey of 22 Co-operative Farming Societies in the country. They were not a representative sample by any means because the State Governments recommended only the more successful societies for study. It was found that joint cultivation is practised only in 16 out of the 22 societies. In seven of these societies the land has been obtained from the Government; in three of them it has been obtained in one block or two by lease or purchase from a landlord. Thus, there are only twelve societies in which members have pooled their existing holdings. But in eight of these twelve, most or all the members do not perform any farm work. In seven societies out of twenty-two, members also hold land outside the farm; in one, their parents do so. It appears, therefore, that most of the so-called co-operative farming societies are either settlement societies or societies run on capitalist lines by groups of absentee landowners having all the work done by hired labour—a kind of joint stock estate farm established by joint families or extended families merely to secure the concessions given by Government in the form of loans or subsidies to co-operative farms. Some of the societies formed with the Government land continue to exist only because members have no rights of transfer in the land which is allotted to the societies. If rights were given to the individual members, the societies would most likely be dissolved. The majority of the societies can be written down as failures today, although it is only five years or so since they were established.

Co-operative societies in the sub-montane regions of Uttar Pradesh, consisting either of political workers who had fought against the British or of refugees from Pakistan (who, too, had gone through a common crucible of suffering) were established in 1950 on land reclaimed by Government. They proved an utter failure after a working of two or three years; some proved even still-born. Government is now finding it difficult to realise its loans.

An Indian Communist leader, Shri E. M. S. Namboodiripad, former Chief Minister of Kerala, also does not consider co-operative farming a practicable proposition. In reply to a question on the subject he said that "service co-operatives which would supply seeds, manure, implements, etc. would be welcome in the State but joint farming co-operatives where the whole process of cultivation was done by co-operatives would not be feasible at present".[1]

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[1] Vide *National Herald*, Lucknow, Sept. 17, 1957.

The use of the words, 'at present' is significant. Shri Namboodiripad knows that joint farming is not a practicable proposition under the present democratic Constitution of India. That is why, again, the Communist Party of India would distribute the surplus land that may be available after imposition of a ceiling on large holdings, among the landless, for individual cultivation rather than have it jointly cultivated, as would Congressmen in pursuance of the Nagpur Resolution of the Indian National Congress passed in January, 1959. The Communists are a clever people and realise that the time for pooling of land and labour will arrive only when they, after securing the good will of the peasantry, have attained absolute political power and clamped down a dictatorship.

According to a news item published in the *National Herald,* Lucknow, dated June 19, 1958, "evaluation by the Planning Commission and other evidence in the past have established that of the already existing 1,600 co-operative farming societies no more than 50 can be said to be reasonably successful." Yet the Co-operation Division of the Union Food and Agriculture Ministry asked the State Governments to start some 513 experimental co-operative farms during the financial year, 1958-59.

Peasants will not be persuaded easily to give up their independent way of living and will always prefer retaining their own individualities and prospects of bettering themselves by their own efforts to sinking or merging their identities into a collective enterprise or, for the matter of that, into a co-operative farm. By far the most eloquent proof of the ineradicable individualism of the peasants is furnished by the fact that "in 1941 during the first months of German occupation, in remote villages where, after the retreat of the Soviet Army, the Russian peasants felt free to act according to their own wishes, in all cases they dissolved the *kolkhoz* farms at once and turned to individual farming. The young *kolkhoz* members were no exception".[1]

The only merit of a co-operative farm compared with a collective farm, which lies in the fact that members remain owners of the land they contribute, proves its undoing. Members are, and ought to be, entitled to resign and whether they resign, or are expelled, free to withdraw their land from the pool. That being so, occasions in the varied tasks of cultivation and in an organisation where a large number of persons work together, when they will fall out, will be frequent. The area of the farm will, therefore, soon dwindle. If on the other hand, the would-be members are told at the outset that they will not be allowed to take their lands in any eventuality, they will not join at all.

[1] *Farm Economics:* Dr. Otto Schiller, May, 1956, p. 308.

The kind of farming that is advocated by the Planning Commission and others in our country will lack both the advantage of joint farming in the USSR and China, *viz.* compulsion, and the advantage of individual farming practised in the rest of the world, *viz.* incentive for personal profit. Co-operative farms will fail as soon as they are set up, and we will have either to retreat to individual farming, or advance like the Chinese to the advanced agricultural producers' co-operative, which is a synonym for the Russian collective farm.

In fact, if we have to take the Chinese as our model, we will have to travel much faster than a democratic country as India has bargained for. According to the latest reports, the Chinese have gone one step further even than the Russians. All that has been said in this book so far about the Chinese agricultural economy has become past history in a matter of months.

While the world's attention in the third quarter of 1958 was focused on the Quemoy crisis, Red China went through a new and gigantic domestic upheaval, as a result of which the whole peasantry, 500 million people, were organised into Communes. In the characteristically Chinese manner, the first communes came into existence 'due to the local initiative of peasants'. And, according to an article by Balarka in the *Hindustan Times*, New Delhi, dated December 28, 1958, within a month of the Communist Party's decision, nearly 90 per cent of the people in villages were in the communes.[1]

A commune is formed by the merger of a number of collective farms, or, the 'advanced' agricultural producers' co-operatives, as the Chinese call them. An agricultural producers' co-operative was generally co-extensive with a village while the commune is co-extensive with a *hsiang* (a big village or group of villages forming the lowest administrative level under the Constitution of 1954) and avowed aim of the Chinese communist leaders is to extend the boundary of the communes still further.

The commune represents a social unit combining industry, agriculture, trade, education, culture, politics, local government and military affairs, whereas the agricultural producers' co-operative was a social unit concerned with only one field of economic activity —agriculture. Communes have revolutionised ownership, labour, consumption and family life as well. Private ownership has been abolished not only in land and housing but even in domestic equipments such as cooking pots and so on. The principle of distribu-

[1] According to recent official reports from Communist China, 99.1 per cent of the peasants (126.9 million farm households) had been organised into 26,500 communes by early November, 1958.

tion has also undergone a complete change. In the communes the peasant becomes a worker with a fixed income, paid partly in food eaten at the common mess hall and in other amenities, and partly in cash. Labour is militarised to the extreme: each commune has its own militia, and the members are being supplied with rifles and bayonets. Leisure is curtailed with the increasing tempo of regimentation. The party directive asked the members to allow the people only eight hours of sleep.

Communes are so designed and operated as to wipe out the last vestiges of individualism and of traditional family bonds as understood all the world over. Establishment of communal canteens or public service restaurants, the creches, kindergartens and 'happy homes' for the old has revolutionised the family life altogether. The aim was to double the labour force by freeing women from household chores for work in fields and factories. And in fields and factories, husbands and wives, parents and grown-up children are not necessarily in the same team. "Nursing mothers and those of ailing children," says Dr. S. Chandrashekhar,[1] Director of the Indian Institute for Population Studies, Madras, who had visited China recently, "can visit the creches or kindergartens, though this is not necessary as children are under the care of trained nurses and teachers. Parents can give up their bourgeois emotional attachments and stop worrying about their children."

While the commune represents a type of social insurance whereby everybody in the village is assured of a living, a roof above his head and two or three meals a day irrespective of his earning capacity, it also means the total loss of individual freedom and initiative. The Household Registration Law, promulgated in early 1958, imposed harsh restrictions upon the rights of movement and association. Under that law every one was required to notify the police before leaving a place and on reaching the new place. Every one was required to notify the local authorities the arrival of a friend, relation or guest. In the communes all have to take part in military parades in the mornings and evenings and also to attend indoctrination courses and military classes. So that under this latest communist dispensation China has become one vast army camp.

Dr. S. Chandrashekhar remarks: "This is the commune where human beings are reduced to the level of inmates in a zoo. But there is a difference. The animals in a zoo do not have to work hard and, what is more, they do not have to listen to the quasi-compulsory radio, which pours out the latest editorial from the *People's Daily*."

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[1] Article in the *Statesman*, New Delhi, dated January 13, 1959.

As a result, there have been many complaints and the work done in many a commune is poor. Reports of purges in the northern part of Red China in November, 1958, were the first indication to the outside world that the communes had run into serious difficulties. These reports, it may be mentioned, emanated not from propaganda sources but were contained in official communist Chinese publications. Although the party has put off for an indefinite period the establishment of large-scale communes in big cities, it has no intention at the moment to go back on the 'great leap forward' already taken. According to a resolution passed at its historic meeting held at Weechang from November 28 to December 10, 1958, the party has come out with a call that the communes, estimated to total more than 26,000, be "tidied up, checked up and consolidated" by April, 1959. The job is being entrusted to army personnel who will constitute a large proportion of the special 10,000-man inspecting teams in each province, which are expected to "thoroughly reorganise, consolidate and improve" the communes.

The idea of the commune was tried out on a much smaller scale in Russia, and the experiment ended in failure. When Stalin later on set out to collectivise farming, he forbade every mention of the commune, and ever since the commune has remained under something like an ideological ban in the Soviet Union. The Chinese, obviously not content with the collective farm, have now startlingly rehabilitated the commune. They have decided to move henceforth on the road of collectivism quicker and faster than the Russians, and this despite the fact that in technology their farming is very far behind the Russian. On the other hand, as we have seen, Khrushchev has just made a series of important concessions to the peasants, relaxing the Stalinist rigours of collectivisation. He has sold the Machine-Tractor stations, hitherto State-owned, to the collective farms; he has freed the peasants from compulsory food deliveries and he has attempted to place the economic relationship between State and peasantry on something like a market basis. Thus the whole trend of Chinese policy in regard to agriculture has been at variance with Soviet policy. Khrushchev has, in an interview with Senator Hubert H. Humphrey of the USA, published in the *Pioneer*, Lucknow, dated January 21, 1959, branded the commune system as 'old-fashioned and reactionary.' He said, "We tried that right after the revolution. It just does not work. That system is not nearly so good as the State farms and the collective farms." The reason given was that the principle, *viz.* 'From each according to his abilities, to each according to his needs,' on which the communes are based was not workable and that 'you can't get production without incentive.'

It may be added that Khrushchev preferred State farms because there a worker gets a remuneration according to the labour put in, and collective farms because he has latterly been trying to reform them and provide incentives to its members.

Humphrey writes that he was startled at the leader of world communism rejecting the very core of Marxist theory. The Senator asked if his statement on incentives was not 'rather capitalistic.' 'Call it what you will," Khrushchev replied, "it works."

To come back to the co-operative farm: granting it has certain advantages over the collective farm or the commune, the organisation is likely soon to fall apart. For, we should remember that it is not a problem of members alone, but of their respective families also. From a worker on his own individual plot of land the peasant will become a cog in a vast land factory. It will mean an overwhelming change in his life. Women and children from different families will come into closer contact and rub shoulders with each other far, far oftener than previously. Members will be working side by side, day after day, and depending on the co-operative farm for all or nearly all of their annual income. Problems of personal equation are bound to arise and frictions of various kinds are likely to develop. A co-operative farm is very different in this respect from other co-operative enterprises, *e.g.*, a co-operative consumers' store or a co-operative brick-kiln where a member's interest is very much limited. In the co-operative farm, a member's interest and association with the business activities have, of necessity, to be much more intense and comprehensive. A co-operative farm will embrace a farmer-member's entire economic life and leave little or no room for exercise of his initiative and judgment, or for unfoldment of his personality.

The reaction of the peasant to joining a co-operative or collective farm where all the three factors of production, *viz.* land, labour and capital, will be pooled, is, therefore, understandable. Human nature being what it is, even brothers born of the same mother usually separate from one another after the head of the family has been removed by death or other cause. In the circumstances it is utopian to expect that an average householder will, all of a sudden, identify his interests with the interests of those hundreds of persons in the village or neighbourhood who were total strangers to his life hitherto. A co-operative farm brings together indiscriminately under its banner persons with no long-established ties of kinship or social level—Hindu or Muslim, Brahmin or Harijan—owner, tenant or labourer. Were a man to reach the heights wherefrom he could see his own good in the good of every other human being, he will cease to be a householder that very day. The ties of

family, language, religion and country would no longer have any meaning for him. In such ideal conditions planning will not be necessary. Economic laws will become infructuous and, indeed, even government will itself be a costly luxury. The mother is able to nurse and nourish her child because she is selfish, because in the child she sees her own image. Did every other child in the village, or in this wide, wide world occupy the same position in her eyes as her own, she might as well turn a *sanyasini*. In our enthusiasm for a millennium right now in our own lives, we must not forget that man is not entirely a rational being. He is governed more by heart than by mind, and the heart has not yet made (whether it ever will make, being doubtful) the same advance as the mind which has narrowed down physical space and made world a smaller place than it was in the days of our forefathers. Scientific progress or progress in control of the outer world has not resulted in greater control of the inner world of the self, without which a large joint economic undertaking cannot be run smoothly or successfully. Man remains as selfish or greedy, proud or jealous, and ambitious as ever.

The Patil Delegation admits that there are inherent difficulties in the way of introduction of co-operative farming. It says—

> The difficulties inherent in the change from individual farming to agrarian co-operatives are great and must never be minimised. Individual owner is his own master. If he joins a co-operative, he has: (i) to surrender his right of individual management of his farm, and accept the discipline of a group; (ii) to place his capacities for production at the disposal of the group, and accept their valuation of them; and (iii) to accept some diminution in the transferability of his individual interest in land. These disadvantages appear formidable to him. His apprehensions could, indeed, be removed to some extent by a demonstration of successfully-run agrarian co-operatives. It could be shown, for instance, how techniques of working can be introduced which provide for maximum individual participation, do away to a large extent with the evils of bureaucratism and commandism and thereby to ease the acceptance of group discipline. Evolution of norms and targets can provide respectively for the preservation of individual and group incentives. Co-operatives also offer opportunities for sharing much wider responsibilities than in individual farming, thus mitigating the possibility of a wrong judgment of individual capacities. Though joining an agrarian co-operative does mean a diminution in the transferability of individual interest, it is partly provided for by allowing the free exercise of the right of a member to leave the co-operative at his will. Once he is out, his transferability is restored. Moreover, the members could be permitted to transfer their ownership interest, i.e. the right to rent. Thus, by evolving suitable techniques and procedures, the disadvantages which a farmer may feel in joining a co-operative could be minimised, but their basic character would not be altered.

> As against these disadvantages, there would be prospects of increased production and possibilities of a higher standard of living which would be demonstrated as years go by. In joining a co-operative, the farmer will naturally weigh these advantages against the disadvantages. His decision will naturally be subjective because the disadvantages are not capable of economic valuation as the advantages. It is possible that to some the material advantages of increased production would outweigh the sacrifice they would be called upon to make in accepting group discipline, group estimation of their abilities and the restrictions on transferability. To many others, the sacrifice involved in accepting the new way of life may be too great to be compensated by material gains. It has been a common experience of group-working, whether within a family or outside it, that considerations of material benefits often fail to keep the people together, unless there are higher considerations of social value. For inducing peasants to join co-operatives on any scale and later to keep them together, it would be necessary, we feel, that considerations of material gain are combined with higher considerations of socialism and patriotism. (pp. 145-146)

The issue has not been put squarely. The summing up of the case by the Patil Delegation assumes that co-operative farming will lead to increased production. Facts and figures given in these pages do not, however, support this view. But even if the assumption made by the delegation is correct, for the overwhelming majority of the peasants increased material benefits brought about by co-operative farming will not compensate for loss of the individual freedom that they enjoy today on their independent farms. As if in proof of this realisation the report goes on to provide two safeguards which, in their view, should satisfy even the most extreme advocates of democratic values—

> We are insisting that the principle of voluntariness should be scrupulously adhered to and there should be no coercion of any type in inducing farmers to join co-operatives. And, secondly, a person should be free to leave a co-operative whenever he chooses to do so, his decision being effective at the end of a season. In such an event he should be given a plot of land outside the area of the co-operative so that the compactness of the co-operative is preserved and he should be made to accept liability, if any, for any improvements on the plot of land made by the co-operative. And, finally, all efforts by the State to persuade farmers to join co-operatives must aim at producing in them a conviction to join a co-operative and not act, directly or indirectly, as leaving them no alternative but to join. Various examples of this could be given. If, for instance, under the pretext of making preferential supplies to co-operatives, supplies to individual farmers are barred, they would have no alternative but to join. These examples can be multiplied. The test of farmers joining voluntarily or not is whether the last decision to join is with them. State efforts should produce acceptance by the farmers of the co-operatives born of conviction and not compulsion. (p. 150 of the Report)

The Planning Commission, however, does not believe in any such policy of self-denial or *laissez-faire*. According to it while all cultivators in the village can avail of the general departmental services and the common facilities offered by the multi-purpose, better farming or large-sized credit societies, those alone who pool their lands in co-operative farming societies are to get special subsidies for administrative expenses, credit on specially liberal terms, preference in consolidation proceedings, preference in technical assistance, preference in the supply of seeds, fertilisers and construction materials, and special financial and technical assistance for developing ancillary occupations.

A pertinent question that arises in connection with co-operative farming is—whether we have—in fact, whether any country has—the necessary human material. In a large-scale undertaking, particularly, in one which is to be organised on the basis of voluntary co-operation, problems are bound to crop up which would demand leadership and character of the highest order. The organisers will be faced with several weighty problems, such as, relation between the co-operative farm and the Government, selection of members, the taking over of land, draught animals and farm tools; internal management or relation of members *inter se*, the formulation and implementation of production plans, the organisation of labour force into working teams and production brigades; the utilisation of Government subsidy, if any, in terms of finance, equipment and expert advice; the setting up of funds to meet production expenses to acquire means of production, to provide relief and welfare, and for reserves; the provision of cultural and welfare services, and the education of members in the spirit of collectivism (which, in China, is undertaken under the 'guidance' of the Communist Party and the People's Government) etc., etc. A far more difficult and important task, however, than any of these, is the assessment of performance of various agricultural and other operations and their proper remuneration. Differences in skill and consciousness are wide. Unless a proper system of measurement and evaluation of different types of farm work are evolved, jealousies between the efficient and the inefficient worker can easily wreck the society. Production in agriculture does not lend itself to specialisation by tasks and standardisation by products as it does in manufacturing. Measurement and evaluation of various farm operations, therefore, require extraordinary intelligence and scrupulous impartiality. If the farm operations are valued and paid for without much differentiation, inefficiency and light work get a premium and labour costs are inflated; if accurate differential evaluation is attempted, overhead costs are inflated. The Chinese, as

the Russians, have tried to solve the problem by adoption of a system of norms for important items of work. 'Norm' is a standard of daily performance in regard to quantity and quality of output expected of an average member working on a specified job. It is to be seen whether the Chinese will succeed where even after 25 years of experience the Russians have not yet succeeded; for, we still hear of grave 'shortcomings in the standardisation of work, in the laying down of standards of production and the valuation of labour involved in work-days' on the Soviet Collective Farms.

Will the requisite enlightened leadership be forthcoming in our countryside? In India which suffers from an acute shortage of competent managerial personnel and general illiteracy of farmers, the disadvantage of large-scale farming is obvious. It will be clear that a co-operative farm would be too big an affair, too big for ordinary peasants to control. We will have to draw upon the towns, which will rule the countryside and rule it unimaginatively, with all the evils that are associated with an unsympathetic bureaucracy. Also, by and large, a city-dweller has always looked down upon a villager as intellectually deficient and culturally backward. The villager has, on the other hand, always considered an urbanite as morally degraded. It is doubtful if the two, with the above background, can work harmoniously, at least, in the immediate future.

Lastly, there is a very important consideration that stands in the way of mechanisation and, consequently, of joint farming in India. We do not produce petroleum in the quantities that the USA and the USSR do. India does not possess enough petroleum even for her existing industries and transport and, if tractors are added, the problem of supply of fuel oil will become very difficult, indeed. Nor can we cover our sky with a network of electric wires which will supply the motive-power to the tractors, combines and threshers all over the countryside. We will, therefore, have to depend on a foreign country to keep the machines going so that our teeming millions may have food. It will be nothing short of lunacy to plan for such an economy. The Nazi hordes in the last Great War had rushed towards the Caucasus not without reason; they wanted to capture the oil wells so that by cutting the vital artery of Russian economy they could the more easily and quickly starve their enemy into surrender.

Part II

CHAPTER XI

POSSIBLE SOLUTIONS

Solution to the problem both of the uneconomic holdings, or the too small size of the farms and of the landless labour in rural areas, in fact, of the entire economic problem of our poverty lies, first, in bringing about—to the extent it is possible—a more favourable ratio than obtains at present between the factors of production, *viz.* land (and other natural resources), labour and capital both on the basis of an individual or an earning unit and of the nation; secondly, in increasing the efficiency of labour and capital and, thirdly, in maximising the utilisation of the natural resources, their quantity and quality already being determined by Nature.

Land and other natural resources being naturally formed, will practically remain constant. Arable area of the country can, however, be increased to some extent by reclamation, that is, by drainage and bringing culturable waste under cultivation. The average size of the farm may also be increased by emigration to other regions and countries, or by transferring some farmers to non-agricultural pursuits, both of which remedies will lead to reduction of pressure on arable land.

Labour includes not only manual or physical labour, but every kind of human activity directed to producing goods and services. It is a variable factor and, with increase in population, our labour force is fast increasing.

Capital, too, largely a product of human labour, set aside for and used in further production, is a variable factor. Draught animals, tool and other equipment, means of irrigation, manures and fertilisers, improved seeds, insecticides, etc., which aid agricultural production, can practically be increased indefinitely provided, of course, that man is prepared to make the necessary sacrifice of not consuming all the product of his labour immediately after production. (Improvements to land, including reclamation, effected by man can also be regarded as capital or capital investments inasmuch and so far as they require labour and some capital in the form of machines and materials of various sorts).

Both labour and capital being variable, man can help retard or accelerate their growth. This retardation of population growth or acceleration of capital formation has to be so effected that production per head or national real income grows faster than population. Obviously, some method or methods of population control

will have to be devised and the rate of capital investment will have to be increased.

Even if population continues to grow at the present rate, production per head can rise, if the rate of capital investment exceeds the rate of population increase. Capital investment is required to bring about technological improvements or innovations which will increase the efficiency or performance both of land and labour.

Land can produce and continue to produce more if resource facilities are available, if technologies referred to in a previous chapter are applied and correct farming methods are practised. These means will both improve and conserve the soil. Labour may become more efficient by better health measures, better training or changes in attitudes towards work.

We have seen that small farms produce and employ more per acre than large farms. In order, therefore, that the arable land may be better and more fully utilised, large farms may be broken up and the area surplus to a minimum divided into small farms and distributed to those who hold no land today although they work on land, or to those who own little land.

Remedies of our poverty, therefore, boil down broadly to reclamation and redistribution of land, emigration to foreign countries, development of non-agricultural resources, intensive utilisation of our land resources and population control.

CHAPTER XII

RECLAMATION, REDISTRIBUTION AND EMIGRATION

Reclamation and colonisation seem scarcely a solution, since land for such extensive colonisation as would be needed is limited. The total geographical area of India is 811 million acres. Land utilisation statistics are available for 718 million acres only which are as follows:

TABLE XXI

		Million acres
(1)	Forests	115.6
(2)	Not available for cultivation	120.3
(3)	Permanent pastures and other grazing lands	21.0
(4)	Culturable waste	58.2
(5)	Groves and miscellaneous tree crops	32.7
(6)	Fallows	68.1
(7)	Net area sown	302.5
	Total ...	718.4

Out of 58 million acres of culturable waste in the country, not more than 25 per cent can lend itself to cultivation in the near future. In spite of the pressure of population, relatively small extension of cultivation to waste lands has taken place during the last 40 years. This is due, partly, to the fact that the exploitation of such waste lands has not been within the resources of the ordinary cultivator, but, perhaps, more due to the fact that such lands are inferior in quality and otherwise unsuitable. Reclamation of any considerable part of these areas, which are relatively inaccessible at present, will be a very difficult and time-consuming process even for the State as it involves large-scale tree or bush-clearance, road-making, anti-malarial operations, water-supply, house-building, etc. Considerations of soil conservation will also have to be borne in mind before large-scale tree-clearance is undertaken. Any reclamation

which accentuates soil-erosion cannot be desirable from the long-term point of view, although it may give some additional production in the immediate future. Also, at best, we will thus be able to settle only one million and a half families in the entire country which will not solve any problems.

Redistribution of Land

As regards the second solution, *viz.*, redistribution of land in excess of a certain area that may be reserved to a large owner it is not going to yield substantial results in all parts of the Union. In some it may not yield results at all worth the name.

The Committee appointed by the Land Reform Panel of the Planning Commission to report on the Size of Farms suggested that a farm which yielded a gross average income of Rs. 1,600 or a net income—including remuneration for family labour—of Rs. 1,200 and is not less than a plough unit, that is, an area of land which an average family could cultivate with a pair of bullocks, or its multiple in area, may be considered as a family holding and that the limit for the ceiling should be three family holdings for an average family in which the number of members does not exceed five, and that one additional family holding should be allowed for each additional member subject to a maximum of six family holdings.

Now the area of three family holdings throughout the country, in terms of the above definition, will measure up to more than 30 acres, and, in some parts, even more than 45 acres.

There is yet another criterion which we may adopt for determining an area that a large farmer may be allowed to retain *viz.*, the one indicated in Chapter VIII, which is more scientific. According to it every person or agricultural worker who carries on farming with animal traction would be entitled to retain 30 acres. An agricultural worker will, of course, include only his wife and minor children, if any, and not other adult members of the family, even if they live jointly with them.

As for mechanised farms, according to Dr. L. Dudley Stamp,* Professor of Social Geography in London School of Economics and world authority on soil use, 100 acres are the optimum for efficient management, so that in the case of mechanised farms a ceiling can, with reason, be placed at 100 acres.

A census of *Land Holdings and Cultivation* was held in most of the states under the advice of the Planning Commission some five years ago. The census related to agricultural lands comprised in

* *Land for Tomorrow*, 1956, quoted in *The Peasant And Co-operative Farming* by Prof. N. G. Ranga and P. R. Parachuri, published by the Indian Peasants' Institute, Nidubrolu, 1958, pp. 56-57.

holdings which consist of cultivable area including groves and pastures. All unoccupied areas such as forest lands and other uncultivable lands and also land held within urban limits were excluded. The entire agricultural land held by a person as owner throughout a state constituted a single holding. In case of joint holdings the area of each co-sharer was treated as a separate holding. The following table shows the surplus land that will be available, according to the census, in case the ceiling is applied at 30, 45 or 60 acres of the area owned, and the estimates of the area that will be required to settle landless agricultural workers and build up the sub-basic holdings to basic size in the various states. The data relate generally to the year 1953-54—

TABLE XXII

(*Area in Lakh Acres*)

States	Area Required		Surplus Area with Ceiling at 30 acres				
	To make up sub-basic holdings to basic size	For settlement of landless at a basic holding	Percentage of holdings affected	Extent	%to area owned	%to col. (2)	%to col. (3)
1	2	3	4	5	6	7	8
Andhra ...	53	47	3.3	21.7	12.0	41	47
Bombay ...	199	52	6.3	61.4	13.0	31	118
Madhya Pradesh	230	94	4.3	55.9	15.0	24	59
Madras ...	77	57	2.4	41.9	12.9	55	74
Punjab ...	8	8	2.0	10.4	7.4	127	135
Hyderabad ...	73	66	13.0	95.5	20.2	130	144
Madhya Bharat...	58	17	5.6	16.5	11.3	29	95
Mysore ...	26	9	3.3	9.0	10.1	35	96
PEPSU ...	1	3	3.4	4.2	8.1	323	124
Rajasthan ...	64	12	...	13.0	9.0	20	108
Saurashtra ...	3	9	29.7	18.6	21.9	547	211

TABLE XXII—(*concld.*)

(*Area in Lakh Acres*)

States	Surplus Area with Ceiling at 45 acres					Surplus Area with Ceiling at 60 acres				
	Percentage of holdings affected	Extent	% to area owned	% to col. (2)	% to col. (3)	Percentage of holdings affected	Extent	% to area owned	% of col. (2)	% of col. (3)
1	9	10	11	12	13	14	15	16	17	18
Andhra ...	1.5	13.4	7.4	25	29	0.8	9.2	5.1	17	19
Bombay ...	2.7	34.9	7.5	18	67	1.3	23.0	5.0	11.5	44.2
Madhya Pradesh	2.0	37.3	10.0	16	40	1.2	27.6	7.4	12	29
Madras ...	1.1	29.9	9.2	40	53	0.7	23.9	7.3	31	42
Punjab ...	0.8	6.2	4.4	76	80	0.4	3.9	2.7	49	49
Hyderabad ...	6.5	61.0	12.9	84	90	3.7	42.7	9.0	58	64.5
Madhya Bharat	2.3	9.0	6.2	16	52	1.2	5.8	3.9	10	34
Mysore ...	1.5	5.5	6.2	22	59	0.8	3.9	4.4	15	43
PEPSU ...	1.3	2.2	4.3	169	63	0.7	1.4	2.8	140	46.5
Rajasthan ...	...	10.0	7.0	16	83	...	8.0	5.0	12.5	66.6
Saurashtra ...	12.2	8.6	10.1	253	98	5.3	4.4	5.2	146.5	48.8

I. The surplus area in Hyderabad is in terms of 'converted dry acres.'

II. In Punjab, PEPSU and Mysore the census was confined to holdings of 10 acres and above. In Rajasthan it was conducted in 22 selected tahsils only. The State Governments have, however, given estimates of area comprised in all owned holdings.

III. A basic holding has been assumed to consist of :—

(1) 10 acres for Bombay, Madhya Pradesh, Hyderabad, Madhya Bharat, Rajasthan and Saurashtra,

and

(2) 5 acres for Andhra, Madras, Punjab, Mysore and PEPSU.

The area under lease in the various states in which the tenant does not hold permanent and heritable rights, included in the three categories of large holdings, according to the above census, is shown in the following table—

TABLE XXIII

(*Area in Lakh Acres*)

States	Holdings of more than 30 acres	Holdings of more than 45 acres	Holdings of more than 60 acres
Andhra	7.41	6.0	5.08
Bombay	27.48	21.54	17.40
Madhya Pradesh	22.55	17.90	15.47
Madras	21.63	18.61	16.56
Punjab	16.97	13.26	10.88
Mysore	3.46	2.70	2.20
Madhya Bharat	6.23	4.62	3.65
Hyderabad*	48.85	27.70	17.20
PEPSU	3.88	2.80	2.17
Saurashtra	6.73	4.50	3.26

*Area converted into 'dry acres'.

Area 'owned' in table XXII includes land held by a person as owner as well as land held by him under permanent and heritable rights. Leased area, shown in table XXIII, is included in the area owned by his landlord. Land in the various states that needs to be redistributed, that is, land under personal cultivation or possession, will, therefore, be arrived at by deducting the acreages given in table XXIII from the corresponding 'owned' acreages shown as available for redistribution in columns 5, 10 and 15 of table XXII. In Uttar Pradesh, according to figures for the agricultural year 1957-58 or 1365 F, treating two acres in Kumaon and Bundelkhand divisions as one acre, there are 26,567 large holdings having an area of more than 30 acres each, 18,361 holdings having an area of more than 40 acres each, and 13,332 holdings having an area of more than 50 acres each. Roughly, 10,04,000 acres of land (including uncultivated area which may form part of holdings) will be available for redistribution if the ceiling is placed at 50 acres, 11,59,000 acres if it is placed at 40 acres, and 14,73,000 acres if it is placed at 30 acres.

According to the Planning Commission:

> There would appear to be an advantage in exempting the following categories of farms from the operation of ceilings which may be proposed:—
>
> (1) Tea, coffee and rubber plantations;
>
> (2) Orchards where they constitute a reasonably compact area:

(3) Specialised farms engaged in cattle breeding, dairying, wool-raising, etc;
(4) Sugarcane farms operated by sugar factories; and
(5) Efficiently-managed farms which consist of compact blocks, on which heavy investment or permanent structural improvements have been made and whose break-up is likely to lead to a fall in production.

In the nature of things, remarks the Commission, these are general suggestions which should be adapted to the needs and conditions of each state.

If we deduct the area of plantations and other farms suggested by the Planning Commission as fit for exemption, and of farms that may have been broken up or reduced in size by succession or transfers since the census was taken, the area in the various States that will actually be available for redistribution today will be found to be much smaller than the figures collected several years ago and given above, indicate.

In order that glaring disparities in possession of land may be eliminated there is an alternative method to that of redistribution directly by the State. Instead of, first, allowing the owners to resume the area in possession of non-permanent tenants and then putting a ceiling on the holdings thus enlarged, as the Planning Commission has recommended, the better course would be to confer permanent rights on the tenants, impose a heavy graduated tax on the area actually under personal cultivation or possession so that inefficient or too large farms may have to sell up, and fix a ceiling on future acquisitions at a low level, say, 12.5 acres for an adult including the spouse and the minor children. So that land surplus to what a person may efficiently cultivate will get distributed automatically, that is, without the State coming into the picture at all. The State will not have to pay any compensation (rather, it will get a substantial amount as tax), nor will it have to incur any administrative responsibility that cutting down of large farms and the distribution of surplus land will necessarily involve. Any feeling of bitterness in the minds of the large farmers that they are being discriminated against as compared with owners of large urban property, would have been avoided and the State saved the burden of financing the would-be settlers. Nor will any feeling of uncertainty be created in the mind of those middle-class cultivators who may not be affected by the ceiling today (for the ceiling, at whatever area we may fix it, will appear as arbitrary and there is no guarantee—these cultivators will argue to themselves—that it will not be brought down to a lower limit tomorrow), or a feeling of discontent among those landless labourers and sub-basic holders who may be left out of the

redistribution. Last, but not least, the redistribution would have been effected without having 'unleashed a class conflict', as the State Communist Party, Uttar Pradesh, in its meeting of April 20-21, 1959, held at Lucknow gleefully says, the Nagpur Resolution of the Indian National Congress passed in January 1959 has done.

There are two dangers inherent in acceptance of the principle of redistribution of land, however theoretically sound, in a country like India where there is little land per capita and little land that will be available by imposition of a ceiling. First, the situation created by acceptance of the principle will arouse land hunger not only among agricultural labourers which was understandable, but among all non-agriculturists in the villages. Second, in the class conflict so unleashed, various political parties will try to outbid each other in the matter of fixing as low a ceiling as possible, and the Communist party, which aims at collective farming, will be the ultimate gainer.

Anyway, if we have ultimate interest of the country at heart and not only slogans, we should take care to see that redistribution of land does not increase the number of agriculturists in the country. The feeling generated by the Bhoodan Movement of Acharya Vinoba Bhave that our economic problem will be solved the day everybody gets a patch of land to cultivate, is entirely unfounded. As the following chapters will show, economic development of a country means gradual decrease in the percentage of its population which is engaged in agriculture, and corresponding increase in the percentage which is engaged in non-agricultural occupations. Therefore, the surplus lands obtained by putting a ceiling on large holdings should preferably be distributed among sub-basic holders rather than landless people. The latter have to be drawn to industries, trade, transport and other non-agricultural avocations. It was the problem of the excluded heirs that is regarded as one of the causes of industrialisation of Germany. The State Governments and the Union Government are likely to become complacent or have less anxious moments over the people's poverty if all those who are landless or unemployed today are tied up to land. The word 'tie' has been used because there is a strange attraction in land; there is a call of the land just as there is a call of the sea. For, although there are bad years, the land never disillusions the holder completely, and hope for plenty in the future always remains.

Howsoever we may proceed in the matter of redistribution of land, taking the country as a whole, it will not make any appreciable difference to the economic situation and will not solve any problems for us.

Emigration

In theory, some relief might be obtained by emigration—a more even distribution of population of the world in relation to land resources of the various countries—but, in practice, emigration is not likely to have much effect in lessening the pressure of population in the homeland itself. As Dr. Kingsley Davis has pointed out in his *Population of India & Pakistan* (Princeton University Press, New York, 1951), emigration from India, which was never large in proportion to the total population, has declined in volume since 1930. The factors that have led to this decline—the treatment of the Indians abroad, the growth of a supply of local labour, the increasing nationalism of colonial areas—show no real signs of slackening in the future. Latin America now has a policy of Asian exclusion. Burma is now independent and does not welcome Indians in addition to those that are resident there. South and East Africa are continually embroiled with their Indian communities. Australia maintains its White-Australian policy. All over the world, migration is confronted with tremendous and increasing obstacles, and there is little sign that Indians will be welcome anywhere. The division of India into Pakistan and the Union of India has weakened the Indian sub-continent as an international power and, apart from its desirability, lessened the chances of forcing an outlet for the citizens of either Pakistan or the new India. Only a major world catastrophe would seem to alter the situation. Short of such a catastrophe, it seems unlikely that migration will constitute a relief—a solution—for our population problem.

CHAPTER XIII

NEED FOR NON-AGRICULTURAL VOCATIONS

A more constructive solution lies in the development of non-agricultural resources which might permanently draw off some of those peasants who possess uneconomic holdings and landless labourers who find their wages unremunerative, and which might further serve as a subsidiary source of income to those who still remain in agriculture. Provision of employment opportunities will bring income and, as we will see, non-agricultural employment, at the present stage of world development, brings greater income than agricultural for the same amount of energy expended.

All economic activity, industry or production, may be classified as Primary, Secondary and Tertiary. Agriculture is commonly grouped with mining, forestry, hunting and fishing under the head of primary industries. Manufacturing and construction (of buildings and public works) are grouped together under the head of secondary production or industries. Tertiary industries are defined by difference as consisting of all other economic activities, the most prominent of which are commerce and finance, transport and communications, public utilities (electricity, gas and water) as well as public and private services. The actual classification, however, differs with the preference of the particular economist. Some put mining and public utilities under the second head. In that case the three sectors are better called Agriculture, Industry and Services.

In a just society labour should be rewarded according to the amount of energy expended and the skill required so that an hour's labour devoted to, say, ploughing, should earn about the same reward as an hour's work by an ordinary factory machine-minder. But in actual fact the net reward of farm labour is far inferior to that of factory labour. The agricultural class has therefore, always and everywhere been comparatively poor, that is, poorer than the industrial, trading and other sections of the community. Sir William Petty had written in 1691:—

> There is much more to be gained by Manufacture than Husbandry; and by Merchandise than Manufacture—Now here we may take notice that as Trades and Curious Arts increase so the Trade of Husbandry will decrease, or else the wages of Husbandmen must rise and consequently the Rents of Lands must fall.[1]

Commenting on the high level of income per head in the Netherlands at that time as compared with other European countries,

[1] Vide *The Conditions of Economic Progress*—1951, by Colin Clark, p. 395.

Sir William shows that this was associated with the employment of a large proportion of the Dutch population in manufacture and commerce. In England, he points out, the wages of a husbandman at that time were four shillings a week while a seaman's wages were as much as twelve shillings a week. "So as a Seaman is in effect three Husbandmen, wherefore there is little ploughing and sowing of corn in Holland and New Zealand, or breeding of young cattle",[1] a considerable proportion of Dutch food supplies being obtained by importation.

Mihail Manoilesco, President of the Union of the Chamber of Commerce and Industry, Rumania, in his book entitled *Theory of Protection and Exchange* (1929), bases his entire argument in favour of protection of agricultural produce on the greater productiveness of labour in non-agricultural pursuits than in agricultural. He quotes statistics showing the total income of twenty-two countries, the proportion of agricultural income to total income, and the proportion of agricultural workers to the total number of workers in each country. Taking the twenty-two countries together it was found that 20 per cent of the total income was produced by 52 per cent of the total number of workers engaged in agriculture, and 80 per cent of the total income by 48 per cent of the total number of workers devoted to non-agricultural occupations. A simple calculation shows that "all other human activities are, on an average, approximately 4.35 times more productive than agricultural activity".

Inasmuch as wealth consists of industrial goods also, countries which have a larger proportion of their nationals engaged in industries (and, therefore, also in services) are bound to enjoy a higher per capita income. Economic development, therefore, means greater growth of the non-agricultural sectors as compared with the primary or agricultural sector. A country will be regarded as economically developed—*i.e.* its national income per capita will rise—to the extent of the proportion of its population that is, or comes to be, employed in the secondary and tertiary sectors. The following table of figures for several countries, although all of them are not the same countries whose figures the author of the *Theory of Protection and Exchange* had collected and compared, affords further evidence of this generalisation. The figures relate to a point of time roughly thirty years later than the one when Mihail Manoilesco wrote his book. During this period in comparatively under-developed countries a proportion of population had further been transferred from primary to secondary and tertiary sectors. The proportion between agricultural and non-agricultural incomes, *viz.* 1 : 4.35 that obtained thirty years before, therefore, moved up to 1 : 3.

[1] Vide *The Conditions of Economic Progress*—1951, by Colin Clark, p. 395.

TABLE XXIV

Percentage Distribution of Labour Force and Net Domestic Product by Economic Sector of Selected Countries

Country	Year	Agriculture percentage share of—		Industry percentage share of—		Services percentage share of—		Comparative net output per worker by sector (agriculture-100)		Per capita Product at factor cost for years 1952-54 averaged over population at mid-year 1953 (U.S. dollars)
		Labour force	Net domestic product	Labour force	Net domestic product	Labour force	Net domestic product	Industry	Services	
AFRICA ...										
Union of South Africa ...	1946	49	14	21	33	30	53	570	650	300
AMERICA										
Canada	1951	19	16	36	38	45	46	130	130	1,310
U.S.A.*	1950	13	7	37	40	50	53	190	130	1,870
Argentina	1947	27	19	30	29	43	52	130	170	460
Brazil	1950	61	35	13	18	26	47	240	310	230
Mexico	1950	61	20	17	24	22	56	450	770	220
ASIA										
India	1951	74	50	10	17	16	33	260	300	60
Japan	1954	45	22	22	31	33	47	280	300	190
Pakistan	1951	79	61	8	6	13	33	110	330	70
Thailand	1947	86	60	2	11	12	29	620	350	80
EUROPE ...										
Austria	1951	33	15	37	50	30	35	300	260	370
Germany (F.R.)... ...	1954	21	11	46	56	33	33	230	190	510
Italy	1954	41	25	32	40	27	35	210	230	310

(*Contd.*)

TABLE XXIV—(*Concld.*)

Country	Year	Agriculture percentage share of—		Industry percentage share of—		Services percentage share of—		Comparative net output per worker by sector (agriculture-100)		Per capita Product at factor cost for years 1952-54 averaged over population at mid-year 1953 (U.S. dollars)
		Labour force	Net domestic product	Labour force	Net domestic product	Labour force	Net domestic product	Industry	Services	
Netherlands	1947	20	12	34	36	46	52	180	190	500
Turkey	1950	86	54	7	13	7	33	280	780	210
U. K.	1951	5	5	49	47	46	48	95	105	780
Oceania ...										
New Zealand	1951	18	27	35	30	47	43	60	65	1,000

Source for last column :—United Nations' Statistical Paper, "Per Capita National Product of Fifty-five Countries : 1952-54" (Series E No. 4), Pages 8 and 9.

Source for the rest :—International Labour Review, May 1956, p. 158.

Note 1:—The net national product represents that part of a nation's total output of goods and services which has become available for final consumption and capital formation. It is derived from the combined efforts of the factors of production employed (labour, enterprise and capital), and thus corresponds to the sum of their remunerations (factor cost) and, for the nation as a whole, is identical with the national income.

Note 11:—According to Walter Krause : *The International Economy* (Houghton Mifflin Company), 1955, p. 273, quoted in O.K. Ghosh's *Problems of Economic Planning in India*, 1957, page 31, the per capita annual income of the U.S.A. is over Rs. 7,000 per annum, while that of the U.S.S.R. has been estimated at a little over Rs. 1,500 per annum. Naum Jasny, author of *Soviet Agriculture*, puts the, percentage of people engaged in agriculture including machine-tractor stations etc. in the USSR at 57. Prime Minister Nehru says in paragraph 40 of the second Note on his visit to the Soviet Union and other countries in June-July, 1955, enclosed with his fortnightly D.O. No. 28 dated August 2, 1955, addressed to the Chief Ministers of the various States in the Union, that he was told that excluding 5 per cent engaged in machine-tractor stations and in state farms, the total number of people engaged in agriculture came to 50 per cent. According to table 1 on page 508 given in article entitled the *World's Working Population* published in the *International Labour Review*, May 1956, the percentage of labour force in agriculture, industry and services in the USSR in 1950 was 45, 30 and 25 respectively.

The table shows, first, that a high average level of real income per head is usually associated with a high proportion of the working population engaged in secondary and tertiary industries, and with the transfer of population away from primary industry. A feature common to nearly all the countries shown in the table is that the share of agriculture in the net domestic product falls notably short of its share of the labour force. This shortfall appears to be particularly marked in the less developed countries. For various reasons, the chief being the difference between natural resources: man ratio in the various countries, the correlation between the growth of real income per head, on the one hand, and the growth of secondary and tertiary employment on the other is not uniform, and the co-efficient of correlation varies widely between country and country. Yet of the broad validity of the generalisation itself there seems little doubt. *Land and mineral resources per head of the population being equal, and the quality of these resources and climatic conditions being similar, that country or region is comparatively more prosperous than others where more men are employed in non-agricultural activities than in agricultural.**

Secondly, the table shows that the share of industry and service combined in the net domestic product exceeds that in the labour force for nearly all the countries shown. This also holds true for each of the two sectors separately, although to varying extents. The extent to which the percentage share of the net domestic product exceeds that of the labour force is generally much higher in the service than in the industry sector. This implies that in most of the countries under consideration, the net output per worker is highest in the service sector. The disparity is more pronounced in the less developed countries.

Explanation for relative inferiority of average agricultural incomes might be found, first, and chiefly in the law of supply and demand—in the continuance in agricultural production of superfluous resources of labour and superseded resources of land and capital. Superfluous labour continues in agriculture because of lack of an alternative occupation; superseded land is taken under agriculture because of lack of better land; and superseded or outmoded capital is not written off, primarily because of poverty of the agriculturist and secondarily because of lack of propensity to innovate on his part due to illiteracy. The fact that in the UK an agricultural worker earns the same rate of return as his countrymen in the other two sectors shows that a balance between employment oppor-

* Employment in the industry and service sectors in the UK has reached its maximum level, yet her per capita income is lower than in the USA, Canada and New Zealand. The reason lies in the fact that the ratio of physical resources to man in the UK is lower than in the other countries.

tunities has been reached, *i.e.* employment opportunities in the various sectors are readily available in this country to all those who seek them. The result is that those who remain in agriculture need not take to marginal or sub-marginal land, and there is parity in the two incomes—agricultural and non-agricultural. In other words, from the point of view of economic development an ideal situation has been realised in the UK. Incidentally, it is this situation—parity of incomes between various classes—that a socialistic society should aim at in any country. Of the 17 countries mentioned in the table New Zealand is the only exception where agriculture or primary occupations are more profitable than those falling in the secondary or tertiary sectors.

Thirdly, agriculture being a biological process, power and machinery are not such effective aids to man's capacity to produce in the sphere of agriculture as they are in that of manufacturing industry which is a mechanical process. In order that an agricultural worker may produce as much as an industrial worker, large areas of land are required which are not available in most of the countries. Even if large areas are available, they cannot be so easily managed as large industrial units.

Fourthly, "The truth is that in manufacturing," says Ehrenfried Pfeiffer[1], "we are dealing with something primarily inorganic. Its general calculability as well as the calculability of its individual factors, are all easily controlled. Agriculture, on the other hand, works with living factors, with the growth, health and diseases of plants and animals. It has to do with the enlivening of the soil. All of its factors are variables. In their individual characteristics they are independent of one another; yet they unite to form a higher unity, a whole, that is to say, an organism.

"Raw materials are received by the factory and are transformed into finished goods. Between these two poles in manufacturing—the pole of the raw materials on one side and of the finished commodity on the other—there stands the machine. The machine is not a variable factor except for deterioration. Agriculture, on the other hand, has for its one pole fertiliser and seed as raw material. It furnishes vegetables, grain, fruits, etc., as the finished product. But between the beginning and the end of agricultural production stands the life process (biological process). Economic thinking could form a correct idea of what takes place in agriculture only if this life process could be taken into its calculation".

Just as cattle and human beings, in respect of manifestations of their life, are not an arithmetical problem, so also soil. Just as

[1] Vide p. 606 preface to his book, *Soil Fertility, Renewal and Preservation*, 1947, Faber and Faber Ltd., 24, Russell Square, London.

the performance of a horse does not depend on feeding alone, and the gallons of milk that may flow out of a cow are not directly proportionate to the pounds of proteins and salts that may be fed to it, so is the productive capacity of a cultivated field also not directly proportionate to the amount of seed and fertiliser applied. A cultivated field is a biological organism like the horse or the cow and, as such, subject to the laws governing the organic—the effect of biological factors. Agriculture, therefore, is subject to peculiar and exceptionally great hazards of weather, blight, plant disease, insect pests, flood and fire. Some of these hazards may be mitigated by science and the worst effects of them may be mitigated by organised efforts; but it is clear that agriculture will always have to reckon with the unforeseeable and largely uncontrollable natural conditions which are the basis of its productive processes. Manufacturing does not suffer from any such hazards and its productive processes can be controlled by man.

Fifthly, there is a vast difference between industry and agriculture as regards their capacity of adjustment to changed conditions. "The manufacturer can discharge labour, introduce new machinery, change his product, reduce costs, or shift to other fields, not easily, but with comparative facility. The growth of a corporate organisation of horizontal or vertical consolidations, and trade co-operation, the development of a more generalised type of professional industrial management, and, above all, the availability of abundant liquid capital, together with the fundamental fact that in most cases industrial costs are an expression of the time involved in production and marketing, all have combined to make the adjustment to changed conditions in manufacturing relatively easy, and hasten the elimination[1] of a surplus of workers or enterprises in any field. In agriculture, on the other hand, with its numerous, scattered, largely unrelated establishments, its small proportion of hired labour, its relatively large fixed capital, its slow turnover, its combination of business and industry with a home and a way of life, its lack of corporate or other flexible forms of organisation, the perishability of its products, and the fundamental control of its productive process by natural processes in which time is an irreducible factor, adjustment is slow and difficult."[2] This difference in the two occupations is reflected in the income derived from them.

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[1] According to *Twentieth Century Socialism* by Socialist Union, Penguin Books Ltd., Harwordsworth, (Middlesex, 1956, pp. 91-92,) inefficient firms in British industry, however, have survived and not been eliminated, because labour, capital and demand have never been sufficiently mobile for choice to switch automatically from the worse to the better firm.

[2] *The Condition of Agriculture in the United States and Measures for its Improvement* (p. 174)—A report by Businessmen's Commission on Agriculture appointed in 1926.

Sixthly, annual average hours of work per person are definitely higher in industries and services than in agriculture owing to the seasonal nature of agricultural work and the large number of part-time family workers.

Then why does a farmer stay in agriculture ?—first, because of the self-sufficient nature of his profession. He is practically sure of raising at least as much as he needs for maintaining himself and his family, and this fact makes him, to a large extent, independent of the existing economic conditions and enables him to defy the trend of economic development for a long period. Second, as already pointed out, it happens because of lack of alternative opportunities of employment. Where such opportunities in manufacturing and service industries are ample, at least, the wage-worker or a farmer's son, whose net contribution to the value of the farm's production is of a value about equal to the income of a wage-earner, makes no delay in quitting the farm.

However, the reasons for difference in the two kinds of income and for the farmer to stick to his land be what they may, industry and commerce to-day are found, by experience, to enjoy a superiority over agriculture as a source of income. That is why the government of every advanced country has, during the last century, tried to develop its own industries and manufactures and to find employment for its nationals in businesses and vocations other than production of raw materials. Importance of agriculture as a source of income in these countries has declined relatively as their standard of living has risen. The movement of working population from agriculture to manufacture and from manufacture to commerce and services in a country is, therefore, a measure of its economic progress.

Figures for various countries given in the two tables below, taken from two different sources, showing the shifts in the proportion of the labour force for the three sectors, have been relied upon by economists to formulate the principle that the different levels of economic advancement in the various countries are very closely associated with the proportion in which their working population is distributed—that economic progress of a country means a decline in the relative importance of agriculture or primary industries, and an increase in the relative importance of the other sectors—

TABLE XXV

YEAR	PRIMARY	SECONDARY	TERTIARY
UNITED STATES			
1870	54.9	20.5	24.6
1880	51.6	22.0	26.4
1890	45.3	23.7	31.0
1900	40.6	24.8	34.6
1910	34.2	28.5	37.3
1920	30.2	30.3	39.5
1930	23.9	28.9	47.2
1940	21.3	29.2	49.5
AUSTRALIA			
1871	43.9	26.5	29.6
1881	38.6	29.8	31.6
1891	32.2	30.6	37.2
1901	32.8	26.9	40.3
1911	30.3	28.8	40.9
1921	25.9	31.5	42.6
1933	27.0	26.0	47.0
1939	23.1	31.8	45.1
1947	18.6	35.8	45.6
GREAT BRITAIN			
1870	18.5	45.1	36.4
1880	15.9	44.4	38.7
1890	15.5	38.5	46.0
1900	14.2	40.5	45.3
1910	14.6	39.4	46.0
1920	14.4	40.3	45.3
1930	12.0 (5.6)	38.3	49.7
1938	11.1 (4.6)	41.6	47.3
BELGIUM			
1880	24.5	38.7	36.8
1890	18.2	40.5	41.3
1900	16.7	43.9	39.4
1910	17.6	50.1 (6.2)	32.3
1920	16.0	49.5 (7.1)	34.5
1930	13.9	50.0 (6.2)	36.1
CANADA			
1901	45.7	25.4	28.9
1911	42.4	24.2	33.4
1931	34.5	26.3	39.2
1941	31.5	29.5	39.0
1945	28.6	31.3	40.1
1946	27.4	32.5	40.1
NEW ZEALAND			
1881	40.3	29.5	30.2
1886	38.3	31.3	30.4
1891	37.0	28.7	34.3

(contd.)

TABLE XXV (*contd.*)

YEAR	PRIMARY	SECONDARY	TERTIARY
1896	37.0	28.6	34.4
1901	35.2	27.5	37.3
1911	30.1	28.4	41.5
1921	28.9	25.5	45.6
1936	27.0	26.8	46.2
1945	23.2	30.6	46.2
FRANCE			
1866	43.0	38.0	19.0
1901	33.1	42.0	24.9
1921	29.4	36.1	34.5
1926	26.1	39.5	34.5
1931	24.5	41.0 (2.4)	34.5
1936	24.2	37.1 (2.0)	38.7
1946	20.6	34.8 (1.6)	44.6
NETHERLANDS			
1899	28.5	35.9	35.6
1909	25.7	36.1	38.2
1920	22.9	37.8	39.3
1930	22.4	37.6	40.0
1938	19.7	34.2	46.1
1947	15.9	33.3	50.8
GERMANY			
1882	41.9	38.9	19.2
1895	35.7	48.2	21.5
1907	23.8	50.6 (4.3)	25.6
1925	17.8	48.9 (3.1)	33.3
1933	16.9	47.4 (2.7)	35.7
DENMARK			
1901	42.4	27.6	30.0
1911	37.3	27.6	35.1
1921	31.7	28.8	39.5
1930	30.6	30.1	39.3
1940	28.9	32.6	38.5
NORWAY			
1875	48.8	24.1	27.1
1890	45.2	26.7	28.1
1900	37.1	31.6	31.3
1910	37.5	29.5	33.0
1920	34.1	31.4 (1.6)	34.5
1930	34.0	28.1 (1.1)	37.9
1939	38.9	23.0	38.1
1946	35.4	26.6	38.0

(*Contd.*)

TABLE XXV (*concld.*)

YEAR	PRIMARY	SECONDARY	TERTIARY
JAPAN			
1872	84.8	4.8	10.4
1887	78.0	9.1	12.9
1912	62.8	17.1	20.1
1920	55.5	20.0	24.5
1930	51.3	18.5	30.2
ITALY			
1871	51.9	32.6	15.5
1881	46.8	36.4	16.8
1901	50.0	30.0	20.0
1911	46.7	31.9	21.4
1921	47.7	29.0	23.3
1931	43.0	32.5	24.5
1936	41.1	31.7	27.2
SWITZERLAND			
1888	32.9	44.6	22.5
1900	27.6	47.0	25.4
1910	22.8	48.2	29.0
1920	22.1	46.4	31.5
1930	21.7	44.6	33.7
1941	20.9	45.8	33.3
SWEDEN			
1900	49.7	20.9	29.4
1910	40.8	30.4 (0.7)	28.8
1920	34.9	35.0 (0.9)	30.1
1930	30.5	35.3 (1.8)	34.2
1940	26.5	37.1 (1.2)	36.4
INDIA			
1881	60.2	28.1	11.7
1911	63.8	15.8	20.6
1921	64.4	14.5	21.1
1931	64.2	13.6	22.2
RUSSIA			
1926	81.0	5.6	13.4
1939	57.8	17.2	25.0

Source—The Conditions for Economic Progress by Colin Clark.

Note 1:—Except Great Britain figures for 'Mining' are included in the secondary sector and wherever available, are shown in brackets.

Note 2:—Figures in this table cannot be compared strictly with corresponding figures given in the next table. In fact, figures from no two sources are strictly comparable for reason of difference in concepts and methods as well as in institutional arrangements for collection of the statistical material.

TABLE XXVI

Country	Year	Labour force (in thousands)				Percent. of Labour Force in		
		Agri-culture	Industry	Services	Total	Agri-culture[1]	Indus-try[2]	Ser-vices[3]
FRANCE ...	1866	8,535	4,384	3,724	16,643	51	26	23
	1881	7,890	4,444	4,210	16,544	48	27	25
	1896	8,501	5,660	4,774	18,935	45	30	25
	1906	8,855	6,338	5,528	20,721	43	30	27
	1921	9,024	6,662	6,084	21,720	41	31	28
	1936	7,204	6,379	6,677	20,260	36	31	33
	1954	5,280	7,154	6,786	19,220	28	37	35
GERMANY[4] ...	1882	7,133	5,990	3,372	16,495	43	37	20
	1907	8,556	9,982	6,099	24,637	35	40	25
	1925	9,762	13,478	8,769	32,009	31	42	27
	1939	8,934	14,418	10,917	34,269	26	42	32
GERMANY (F.R.)	1929	5,274	7,347	5,256	17,877	30	41	29
	1939	5,399	8,424	6,232	20,065	27	42	31
	1954	5,076	11,424	8,142	24,643	21	46	33
GREAT BRITAIN	1881	1,638	6,372	4,785	12,795	13	50	37
	1891	1,582	7,176	5,888	14,646	11	49	40
	1901	1,385	7,158	6,851	15,394	9	47	44
	1911	1,550	9,023	7,269	17,842	9	51	40
	1921	1,381	9,142	8,236	18,759	7	49	44
	1931	1,258	9,717	9,919	20,894	6	47	47
	1951	1,116	11,086	10,281	22,482	5	49	46
ITALY ...	1881	8,600	3,850	2,600	15,050	57	26	17
	1901	9,443	3,879	2,640	15,962	59	24	17
	1911	9,086	4,387	2,929	16,402	55	27	18
	1921	10,264	4,508	3,659	18,431	56	24	20
	1931	9,356	4,924	4,001	18,341	51	27	22
	1936	8,843	5,375	4,128	18,346	48	29	23
	1954	8,468	6,454	5,615	20,537	41	32	27
UNITED STATES	1870	6,910	2,830	3,185	12,925	53	22	25
	1880	8,682	4,139	4,571	17,392	50	24	26
	1890	10,121	5,973	7,225	23,318	43	26	31
	1900	11,122	7,894	10,058	29,073	38	27	35
	1910	11,834	11,622	13,916	37,371	32	31	37
	1920	11,719	13.951	16,763	42,434	28	33	39
	1930	10,753	15,498	21,242	47,492	23	33	45
	1940	9,317	17,560	23,197	50,074	19	35	46
	1950	7,331	21,623	29,488	58,442	13	37	50

(Contd.)

TABLE XXVI—(*concld.*)

Country	Year	Labour Force (in thousands)				Percent. of Labour Force in		
		Agri-culture	Industry	Services	Total	Agri-culture[1]	Indus-try[2]	Ser-vices[3]
AUSTRALIA ...	1911	480	668	790	1,939	25	34	41
	1921	532	790	974	2,296	23	34	43
	1933	588	935	1,150	2,673	22	35	43
	1947	498	1,140	1,368	3,006	17	38	45
EGYPT ...	1907	2,440	380	605	3,425	71	11	18
	1917	2,626	429	949	4,003	65	11	24
	1927	3,525	556	1,169	5,250	67	11	22
	1937	4,308	610	1,177	6,095	71	10	19
	1947	4,398	835	1,495	6,729	65	13	22
INDIA ...	1931[5]	100,037	15,352	25,300	141,035	71	11	18
	1951	103,014	13,733	22,592	139,339[6]	74	10	16
JAPAN ...	1920	14,661	5,721	6,350	26,733	55	21	24
	1930	14,687	5,951	8,411	29,049	51	20	29
	1954	18,060	8,880	12,990	39,930	45	22	33
MEXICO ...	1900	3,177	934	401	4,512	70	21	9
	1910	3,596	1,106	436	5,138	70	22	8
	1921	3,488	561	454	4,504	77	13	10
	1930	3,626	743	587	4,957	73	15	12
	1940	3,831	746	1,117	5,694	67	13	20
	1950	4,824	1,819	1,774	7,917	61	17	22
SWEDEN ...	1910	1,016	565	535	2,116	48	27	25
	1920	1,058	808	699	2,565	41	32	27
	1930	1,041	927	904	2,872	36	32	32
	1940	864	1,070	1,032	2,966	29	36	35
	1950	632	1,267	1,183	3,082	21	41	38
UNION OF SOUTH AFRICA ...	1911	2,186	577	935	3,698	59	16	25
	1921	3,018	547	666	4,231	71	13	16
	1946	2,418	1,026	1,466	4,910	49	21	30

Source :—*International Labour Review*, May, 1956, pp. 508-509.

Note :— 1 "Agriculture" comprises agriculture, forestry, hunting and fishing.

2 "Industry" comprises mining and quarrying, manufacturing, construction and utilities (electricity, gas and water).

3 "Services" comprises commerce, transport, storage and communications, as well as public and private services.

4 Frontiers of 1934.

5 Pre-partition India.

6 Including earning dependents.

In all countries shown in the two tables, with a few exceptions, the percentage share of agriculture in the labour force has shown a downward trend over a long period. In France, Germany, Italy and Sweden, where a relatively high proportion of the working population was engaged in agriculture at the turn of the century—*The International Labour Review* goes on to point out—the percentage share of agriculture has been steadily falling since the latter part of the nineteenth century, and at an accelerated pace since 1920.

The number of workers in the industrial sector has increased steadily in nearly all countries. The only exceptions from this general trend are Mexico and the Union of South Africa, and, although for totally different reasons, Great Britain. The latter country had attained a high degree of industrialisation as early as 1870-1880; the share of industry in the labour force had reached 50 per cent by that date. This proportionate level has held steady with minor fluctuations for the last 70 years.

In the case of the service or tertiary sector nearly all countries have recorded impressive increases. Almost everywhere the rate of growth of the labour force in the service sector has tended to outpace that in the industry sector. The percentage of workers in the industry sector in Great Britain having remained constant, the decline in the relative share of agriculture is offset entirely by the increase in the service sector.

The United States has experienced a phenomenal increase in its labour force, from about 13 million in 1870 to about 58 million in 1950. Since 1910 there has been a continuous drop in the absolute number of workers in agriculture, which by 1950 had fallen back to its 1870 level representing only 13 per cent of the total labour force. Over the same period (1870 to 1950) there was a sevenfold increase of the work force in the industrial sector and a tenfold expansion in the service sector.

The shift of working population in Japan from agriculture to other sectors has been most striking. She has been since 1870 in the midst of a rapid transformation from an agricultural to an industrial-commercial nation.

In the economically less developed countries also, where the rates of increase of the labour force are generally greater than in the industrial countries, the proportion of additional workers who go to agriculture is comparatively smaller than the share of agriculture in the existing work force. In consequence, although there is no net transfer of workers from agriculture and the number of workers in agriculture continues its upward trend, the proportion of agricultural workers in the labour force has declined. This is the case, for example, in Mexico and Egypt.

In the case of India, the proportion of workers in the primary sector since 1881 has steadily increased, and that in the industrial sector has steadily declined—a phenomenon, contrary to the experience of all the other countries considered here and one that should cause alarm to every lover of India.

Things in India, however, were not so bad before. It was not always a poor, undeveloped country depending solely on agriculture. The Indian Industrial Commission of 1916-18 presided over by Sir Thomas Holland opened its report with the statement—

> At a time when Western Europe, the birth-place of the modern industrial system, was inhabited by uncivilised tribes, India was famous for the wealth of her rulers and for the high artistic skill of her craftsmen. And even at a much later period, when merchant adventurers from the West made their first appearance in India, the industrial development of this country was at any rate not inferior to that of the more advanced European nations.[1]

It is to the policy of cur erstwhile British masters that the plight of the country can be largely traced. Indian handicrafts and industries were systematically rooted out by the British manufacturers who had the state power in the country at their disposal. When the Britishers arrived in India, it was not "a purely agricultural country; it was an important manufacturing centre, exporting finely worked merchandise to Europe, Arabia, Egypt and China. Delicate silks, muslins, laces, embroidery, jewellery and rugs were sent abroad. Pere Vatue, in his history, says that India was rising out of her Middle Ages, and her relative prosperity was the product of transitional economy, moving from a closed medieval system into a nascent factory capitalism. Rural artisans were coming to the cities to work in factories, and laying the foundations for an industrial development which could raise the national income and living standards ever higher. There were still occasional famines, a heritage of the medieval period, just as there were in Europe. But famine was on the way out, and it certainly would have disappeared with the development of industrialism just as it did in western Europe. It was the intervention of the English with their insatiably greedy traders that violently cut short India's economic revolution and forced the country back to a medieval economy and into permanent starvation."[2]

To give an example of the foreigner's greed: weavers, silk-winders and other artisans and manufacturers of Bengal in the latter part of the 18th century were often required by the East India Co. to supply a fixed quantity of goods, at a fixed time and at a fixed price

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[1] *Indian Industrial Commission Report*, p. 6.

[2] Vide *Geography of Hunger*, by Josue De Castro, 1952, Victor Gollancz Ltd., London, pp. 157-58.

which was 15 to 40 per cent lower than the market rates. According to a letter written by an English merchant, William Bolts, which was published in 1772, "Weavers, also, upon their inability to perform such agreements as have been forced upon them by the Company's agents, universally known in Bengal by the name of *Mutchulcahs,* have had their goods seized and sold on the spot to make good the deficiency; and the winders of raw silk, called *Nagoads,* have been treated also with such injustice, that instances have been known of their cutting off their thumbs to prevent their being forced to wind silk."

Not the industries alone but agriculture also declined in Bengal under this system; for, the manufacturers of the country were largely peasants as well.

"For the Ryots," Bolts goes on to say, "who are generally both landholders and manufacturers, by the oppressions of *Gomastahs* in harassing them for goods, are frequently rendered incapable of improving their lands, and even of paying their rents; for which, on the other hand, they are again chastised by the officers of the revenue, and not infrequently have by those harpies been necessitated to sell their children in order to pay their rents, or otherwise obliged to fly the country".[1]

Bengal was thus rendered a vast scene of oppression. It was this state of affairs which had led Mir Kasim to revolt.

Such rapacity notwithstanding, the silk and cotton goods of India up to earlier part of 19th century could be sold for a profit in the British market at a price from 50 to 60 per cent lower than those manufactured in England. Consequently duties as high as 70 to 80 per cent of their value were imposed on the Indian imports. When even high duties did not deter English nobility from buying superior Indian goods their use was declared a penal offence.[2]

Says H. H. Wilson, historian of India:

> Had this not been the case, had not such prohibitory duties and decrees existed, the mills of Paisley and Manchester would have been stopped in their outset, and could scarcely have been again set in motion, even by the power of steam. They were created by the sacrifice of the Indian manufacture. Had India been independent, she would have retaliated, would have imposed prohibitive duties upon British goods and would thus have preserved her own productive industry from annihilation. This act of self-defence was not permitted her; she was at the mercy of the stranger. British goods were forced upon her without paying any duty, and the foreign manufacturer employed the arm of political injustice to keep down and ultimately

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[1] *Economic History of British India* by Romesh Dutt, London, Vol. I, pp. 26-27.
[2] For reference see *Bharat Men Angrezi Rajya* by Shri Sunder Lal, pp. 900-903, Vol. II, 1938, Onkar Press, Allahabad.

strangle a competitor with whom he could not have contended on equal terms.[1]

Apart from the discriminatory acts of the British Government the Indian fabrics would not have, perhaps, in the long run, been able to compete with mill-made products of Britain, unless specifically protected by the state. On the other hand, if India were free she would have, in all likelihood, profited from the lessons of the Industrial Revolution, equally well with the Western nations. It is now all a matter of speculation. The fact remains that along with the spread and tightening of the British stranglehold on the country, our industry began to decline and was stifled. The result was that the class of artisans was completely ruined, and nation's economic strength shattered. It was not only the old manufacturing towns and centres that were laid waste, and their population driven to overcrowd the villages; it was above all the very basis of our old village economy, the union of agriculture and domestic industry, that received its mortal blow. The millions of ruined artisans and craftsmen, spinners, weavers, potters, tanners, smelters, smiths, alike from the towns and from the villages had no alternative save to crowd into agriculture. Also, many an Indian peasant, who practised weaving or other handicrafts in the slack period of agriculture, found his subsidiary occupation gone for ever. In this way India was forcibly transferred, from being a country of combined agriculture and industry, into an agricultural colony of British manufacturing capitalism. This conclusion is illustrated by the table on the next page.

It is thus found that in 1931 only 26.0 per cent of the non-agricultural workers were engaged in their traditional occupations and 58.0 per cent of those who had given it up, or 50.0 per cent of the total, had taken to agriculture and other allied pursuits. "The proportion of artisans in India", says Josue De Castro, "fell, during the nineteenth century, from 25 per cent of the population to 10 per cent, while the population of agriculturists rose from 60 to 75 per cent".[2]

The percentage of workers engaged in agriculture in the USA came down from 86 in 1820[3] to 53 in 1870, 26 in 1920 and 13 in 1950, and that in Japan came down from 84.8 in 1872 to 45 in 1954. During the same period the percentage in India under the British rule went up. That is, while in other countries new industries were springing up which drew off workers from agriculture, in India the reverse

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[1] Romesh Dutt, *op cit*, pp. 262-63.
[2] Josue De Castro, *op. cit.*, p. 169.
[3] *The Condition of Agriculture in the United States and Measures for its Improvement*—Report, *op. cit.*, pp. 132-33.

TABLE XXVII

Caste, Tribe or Race	Earners and working dependents	Those who returned their traditional caste occupation as principal means of livelihood	Those who returned exploitation of animal and vegetation as principal means of livelihood
1. Barhai	760,060	336,176	283,300
2. Bhangi	555,529	310,983	118,838
3. Bhat	50,186	3,871	31,324
4. Chamar	5,077,807	386,197	3,558,939
5. Darzi	212,359	123,687	38,727
6. Dhobi	951,058	436,699	345,881
7. Jhinwar	933,368	152,499	443,996
8. Khatik	103,582	22,258	51,609
9. Khatri	185,173	92,992	17,712
10. Kumhar	995,309	369,023	390,887
11. Lohar	763,482	270,453	268,014
12. Momin	1,234,393	409,656	520,340
13. Mali	360,938	15,061	248,823
14. Nai	1,079,229	502,552	351,164
15. Od, etc.	50,620	23,389	9,383
16. Pinjara	1,098	268	231
17. Sansi	10,664	402	3,991
18. Sonar, etc.	274,134	166,256	53,178
19. Tanti and Koshti	427,344	112,571	104,915
20. Teli and Chanchi	1,783,788	383,465	935,926
Total	15,809,612	4,118,408	7,877,178

Source :—Census of India, 1931, Vol. I, India, Part II—Imperial Tables, pp. 416-417.

process was under way. Here, established industries declined leading to over-crowding in agriculture.

In these facts and figures lie hidden the cause of our poverty. It consists not so much in lack of natural resources or lack of natural ability of the population as in the pattern of our economy where too many people are living on land but do not find full employment thereon and produce little. The situation is typified in the problem of inefficient agriculture and uneconomic holdings which are, with progress of time, getting smaller and smaller still.

"At the root of much of the poverty of the people of India, and of the risks to which they are exposed in seasons of scarcity," the First Famine Commission, 1880, rightly diagnosed, "lies the unfortunate circumstance that agriculture forms almost the sole occupation of the mass of the population, and no remedy for present evils can be complete which does not include the introduction of diversity of occupations through which the surplus population may be drawn from agricultural pursuits and led to find the means of subsistence in manufactures or some such employments".

It is thus agreed between all economists and well-wishers of the country that measures for diversification of employment and production have to be taken, that industrial or non-agricultural outlets have to be provided for a good many of our people. The question is what form this diversified production or industrial development should take and how far we should go, rather how far it is possible for us to go, on the path to non-agricultural employments. There are two schools of thought on this question: the one contends that we should rely chiefly on large-scale mechanised industry and, the other that small-scale decentralised industry geared in with agriculture should predominate. The latter would also lay great emphasis on handicrafts and cottage or village industries.

CHAPTER XIV

CASE FOR INDUSTRIALISM

There has always been lack of equilibrium, rather, a sort of antagonism between the cities and the countryside. This is particularly so in our land where the gulf of inequality between the capitalist class and the working-class pales into insignificance before that which exists between the peasant farmer in our village and the middle-class town-dweller. India is really two worlds—rural and urban. The relationship between the countryside and the cities is, therefore, a vital problem to us.

There is no example which India can exactly follow in solving the problem of reconciling the development of the countryside with growth of industries. Britain had, consequent on the Industrial Revolution of the 18th century, destroyed its countryside in the effort to industrialize herself. So had the Soviet Union, consequent on the Bolshevik Revolution of 1917. Will India succeed where both Capitalism and Communism have failed?

Advocates of industrialism plead that in this modern age advances in science and technology have made it possible for man to produce the means of satisfaction of his wants with minimum expenditure of energy. It has increased man's power to produce wealth a ten-fold, nay, a hundred-fold what it was previously. At this stage it is unthinkable that we in India remain content with, or continue to have, an economy where her natural physical resources remain unutilised while the nation leads a life of want and misery —that it will be an act of utter folly on our part if we refuse to make use of the power that science and technology have placed at the disposal of man for betterment of his lot. India is one of the poorest countries of the world and it is through intensive industrialisation alone—through marriage of man with the machine—that her poverty can be eradicated.

> All former civilisations and cultures were fundamentally based on slave labour. The Greek poets and philosophers had the leisure to discuss abstruse subjects for long hours only because there was slave labour to work on their behalf and create an economic 'surplus' to maintain them while they engaged in these abstruse discussions. Today in the machines we have our slaves. Scientific technique has today reached a stage where we can, if we could, organise plenty and leisure for all—yes, 'freedom from want' for all.[1]

[1] Dr. P. S. Loknathan's article entitled, *A Matter of Bottlenecks* published in *The Eastern Economist*, New Delhi, dated 30th July 1943, p. 378.

In the developed countries great strides have been made in the techniques of manufacture. There, automation is ushering in a new revolution in industry. The average American worker produces nearly eight times as much as the British worker, and five to six times compared to the Italian worker. We at present stand no comparison with the productivity capacity of the workers of these industrially advanced countries. Productivity is the ratio of the goods or services produced, *i.e.* output of wealth, to the input of resources required for the production. The resources include men, power, capital, machines and raw materials. We possess men and materials. The former need to be supplied power, capital and machines so that out of the latter—raw materials—goods may be produced which will wipe out our poverty.

Advocates of industrialism point to the immense wealth and high standards of living in all the industrialised countries of the world, particularly, the example of the USA, as a complete and irresistible proof of their contention. Judging from the percentage of the people engaged in the secondary and tertiary sectors, next to United Kingdom, USA is the most non-agricultural or highest industrialised country and with only seven per cent of the world's land area and six per cent of its population, turns out about one-third of the world's total goods and one-half of all manufactured products. Contrary to general belief, however, she exports only five per cent of this vast produce and consumes the rest herself, excepting, of course, what she sets aside for capital formation (which will further increase national income in the years ahead). That is why the USA enjoys the highest material standards of living yet known anywhere. An average factory worker now works only 40 hours a week and earns $2 per hour. And these standards are rising every year! In 1949 the per capita income in the USA stood at 1,433 dollars; the average for 1952-54 stood at 1,870 dollars.

According to a news-item published in the *Pioneer*, Lucknow, dated 19-11-1957, there was a rise of 5.5 per cent in personal income of Americans in the first ten months of the year—

> Washington, Nov. 18—Personal income of Americans during the first ten months of 1957 was at an annual rate of 342,500 million dollars—17,500 million dollars above the corresponding period a year ago, the Commerce Department reported today.
>
> The Department said this represented a 5.5 per cent rise in personal income which embraces wages and salaries, net income on business proprietorships, dividends, interest and rents received from real estate and other kinds of individual income.
>
> The October income flow this year was put at 11,500 million dollars—3.5 per cent above October last year—UPI—AFP.

And lest we forget—it is the introduction of machines that has increased the productivity of the USA, and the current emphasis on automation will increase it still further. In 1850, 65 per cent. of total power requirements were supplied by men and animals. Today, the figure is 2 per cent, power machines providing the remaining 98 per cent.

Cannot India, it is asked, which also has rich material resources and potentially a much larger internal market, provide the same living standards to her people through large-scale mechanised industries? Thirty-six per cent of the employees in large-scale industrial establishments of USA (1947) were working in establishments with more than 1,000 employees each and an average labour strength of 2423.

In this fast-changing world in which countries are coming closer and closer no nation can live a life of seclusion. We must have commerce and intercourse with other peoples. Not to have large industries of our own, therefore, is to make our economy subservient to the economy of foreign countries. Further, large-scale industry alone can provide the means of national security and independence.

Large-scale industrialisation, it is contended, will also help solve our population problem and that in two ways. First: the majority of industries and services in the modern community including most forms of large-scale manufacture, transport, postal communications, banking, insurance and the like are quite specifically benefited by increasing population. Colin Clark considers that these industries "work under the law of increasing returns rather than the law of diminishing returns. The law of increasing returns prevails in any industry where, as a consequence of increased scale of output, we can expect to obtain increasing returns per unit of labour or other economic resources employed. In fact, most of the economic operations of a modern community are carried out in such a way that, if there were an increase in the population and the size of the market, organisation would become more economical and productivity per head would increase, not decrease. Without the large and densely settled populations of North America and Western Europe, most modern industries would be working under great difficulties and at very high costs—it is doubtful, indeed, whether they would have come into existence at all".[1]

It is pointed out that, when Britain stood on the threshold of industrial revolution at the end of the 18th century, she was regarded as grossly over-populated. But not only did capitalism or industrialism absorb the existing hands: it positively resulted in a

[1] Colin Clark's article, *Population Growth and Living Standards* published at pp. 101-2, *International Labour Review*, Vol. LXVIII—No. 2, August 1953.

tremendous upsurge of population. Great Britain's population greatly increased in the 19th century; similar phenomenon was observed in the early stages of industrial development in Germany and Japan. Comparing the conditions of India and European countries, the British Communist leader, Mr. Rajani Palme Dutt, indirectly refers to the population-sustaining capacity of industrialism in the following terms—

> The decisive difference between India and the European countries is not in the rate of growth of population, which has been more rapid in the European countries. What makes the difference between the conditions of India and Europe is that the economic development and expansion of production which have taken place in the European countries, and have facilitated a more rapid growth of population, have not taken place in India. [1]

This is as regards the early stages of industrial development. In the long run—and this is the second reason, it is said, how the process will help solve our population problem—industrialisation will encourage the development of new urban patterns of living which lead to the control of the high birth-rate. It is almost a truism to say that increasing incomes by changing psychological motivations and economic desires tend to bring about small families. This tendency is strongly reinforced by increasing urbanisation, rising cost of technical education, more facilities of recreation, availability of effective and clean contraceptives, etc., etc. This has been the experience of most of the advanced industrialised nations of the West and Japan. There is no reason, it is said, why India should not conform to this experience of other countries where industrialisation has ultimately led to deceleration of the growth rate, if not to decreased fertility.

Large-scale industrial economy, it is again contended, does not stand in the way of realisation of our third aim either, *viz.* equitable distribution of wealth, even where it is private economy that obtains. This is proved by the example of the two most highly-industrialised nations, *viz.* the UK and the USA, where a comprehensive system of social insurance covering the whole population has been established from the cradle to the grave. Through far-reaching measures of social security,—old-age assistance, subsidies for housing, labour legislation, agricultural price supports, minimum wage laws, and changes in taxation methods (of which the graduated income-tax is the outstanding example,)—not only has the worker and the salaried employee's real income in recent years grown, but his proportion of the total national income increased materially. At the same time, the average income of the top people both in the UK and the USA has decreased substantially.

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[1] Vide *India Today*, People's Publishing House, Bombay 1949, p. 57.

According to a British Socialist Union publication:

> Income-tax in the United Kingdom has so far proved to be the best instrument for cutting away income differences. It is nicely flexible; it can be graduated steeply, so that the higher the income the higher the rate at which it is taxed; it can be relaxed to allow for special needs. As a result of generations of stiff income-taxing, the gap between the extremes of wealth and poverty has been narrowed in this country. Something like a national maximum of net income (that is, income after taxation) has been established. To retain much more than this, so very much more has to be earned —because most of the extra will be taxed away—that very few can manage it. Out of the revenue gained by taxation, the government has been able to build up what amounts to a national minimum at the other end of the scale. All sorts of 'social incomes' are distributed—pensions, family allowances, national assistance, sickness benefits and so on—which between them go a long way to ensure that everyone has at least the minimum on which to live.[1]

Figures showing how the gap between the extremes of wealth and poverty has been narrowed in the UK during the period, 1938-1952, are given in a table on the next page.

As regards the USA, no figures of earners in the various income-groups are available to us, but it is known that in the 1930's an extensive body of federal legislation was enacted to correct the abuses of unbridled capitalism. This dealt with strict government control of the monetary system, strengthening of the labour unions, and extensive social welfare legislation.

Originally established at low rates, the income tax in the USA together with a high inheritance tax has become the greatest economic and social force in the USA. By a system of graduated rates, which range from 22 per cent to 91 per cent of net income in the highest brackets, the income-tax has deterred the excessive amassment of wealth. The tax structure has become a major force in the development of a large middle-class. In terms of 1955 dollars the consumer units (families, etc.) which earned over $4000 a year have increased 25 per cent since 1941. In 1929, only 20 per cent of the consumer units earned more than four thousand dollars. Today, 48 per cent do. In view of the rising real income per head in the country the increase in strength of the middle class is due as much to persons from the lower income-groups moving up as to those in the higher groups being made to move down.

If, on the other hand, the industrialised country has a socialist structure, the problem of gross inequalities between the income of one man and another will have disappeared in the very process of its establishment.

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[1] *Twentieth Century Socialism* by Socialist Union, Penguin Books, 1956, pp. 77-78.

TABLE XXVIII

Redistribution of Personal Incomes in the U.K.

Name of Income	Number of Incomes (in thousands)		Total income before tax (£ million)		Total income after income and super tax (£ million)		Proportion of income retained after deduction of taxes		Proportion of income that would have been retained in 1952 at 1938-39 rates of tax*
	1938	1952	1938	1952	1938	1952	1938	1952	
1	2	3	4	5	6	7	8	9	10
Personal income which can be allocated to different ranges. ...									
Under £ 250 ...	Not available	9,090	2,589	1,405	2,585	1,394	99.8	99.2	99.1
250—499 ...	1,890	9,600	631	3,580	611	3,395	96.8	96.2	96.1
500—999 ...	530	5,805	361	3,737	322	3,454	89.2	92.4	91.6
1,000—1,999 ...	183	740	247	980	202	767	81.8	78.3	83.7
2,000—9,999 ...	98	254	361	878	256	501	70.9	57.1	72.1
10,000 and over ...	8	11	168	192	69	42	42.3	21.9	45.8

Source :—CSO Blue Book on National Income and Expenditure, 1946—52, HMSO, August 1953, p. 27.

Notes :— 1 A married couple is for income-tax purposes counted as one individual.

2 In addition to the income shown in this table there are amounts accruing to persons that cannot be allocated to particular ranges of income. These are estimated to have been £673 million in 1938 and £1,906 million in 1952.

3 The estimates of income in this table relate to calendar years; the tax rates used are those that were current in the fiscal years, 1938-39 and 1952-53.

*This column indicates the proportion of income in 1952 that would have been retained if the 1938-39 tax rates were to be applied. The egalitarian effect of direct taxes may be seen by comparison of columns (9) and (10).

As regards the fourth aim, *viz.* that of a political democracy, the advocates of industrialism can point to the example of so many countries where it abides side by side with large-scale industry. A country can become a great industrial state and yet remain a democracy. The USA has become an economic giant that it is "without giving up any of the principles basic to a free society. Freedom of speech and of the press, the right to criticise, the right of assembly and of petition, equality of opportunity are more firmly entrenched than ever".[1]

These observations are equally true of the United Kingdom. In both countries, it is pointed out, laws have been framed to prohibit trusts, cartels, monopolies or agreements intended to restrict trade or production or to maintain prices, so that concentrated economic power may not affect or prejudice free working of the political apparatus.

Finally, the advocates of industrialism argue, the industrially advanced countries of the West no longer look down upon small-scale industry as outmoded remnants of a backward economy. It is a mistake, they say, to assume that the big firm is the enemy of the small business and that it would ultimately eat it up. Far from being a relic of the past, the small-scale sector in Europe exists in its own right and has a definite economic and social part to play. In fact, industry and handicrafts are complementary. Large-scale industry cannot do without the help of small *handicraft workshops*, and in some countries the work is shared among firms according to the kind for which they are best suited. In Western Germany in the manufacture of motor-cars, motor-cycles and bicycles, and even in ship-building, industry often makes use of *handicraft firms* to manufacture or assemble components. Quite apart from the fact that a prosperous handicraft business is a valuable customer for firms manufacturing machinery, tools and production equipment, there is a striking parallel between the economic and industrial development of a region and the development of the handicraft trades.

The main handicraft trades are food and catering, building, clothing, textiles and leather, metal and wood-working. They cover (i) production for a limited market to meet the special needs or tastes of consumers; (ii) installation, repair and assembly work as carried out by locksmiths, clock repairers, electricians and cobblers; (iii) personal service, *e.g.* hairdressing, laundering, dyeing and cleaning and car servicing; and (iv) quality production and artistic trades.

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[1] Vide the USA Ambassador, Ellsworth Bunker's speech at a luncheon meeting of the Indian Junior Chamber of Commerce in New Delhi on April 21, 1957.

CHAPTER XV

CONDITIONS FOR INDUSTRIALISM NON-EXISTENT IN INDIA

It is a formidable case that the advocates of industrialism or further large-scale industrialisation of India bring forth. Let us, however, look at the facts a bit closely. There are three factors of production, *viz.* land (and other natural resources), labour and capital. There is another factor which, though not a factor of production, yet affects the productive power of an undertaking, *viz.* the efficiency of labour and capital that may be brought about by innovations or technological improvements. The total real income of a country, therefore, is a function of the size and efficiency of labour and capital relative to natural resources. Of these factors, the quantity of the first, *viz.* natural resources, is, for all practical purposes, constant and, except for the part which has not been surveyed and may be lying hidden underground, is known; the other three *viz.* labour, capital and innovations are variable.

Obviously enough, economic development in the sense of a progressive increase in production per head requires that an increase in one or more of the variables, (labour, capital and innovations) helps to increase output more rapidly than population. Of these variables, innovations or technological improvements, except those which are embodied in capital, are not difficult of achievement. They can be sought within the country itself and, if necessary, the technical know-how through which improvements can be effected and utilised, can be acquired in foreign countries. But capital is not so easy to obtain. We have to accumulate it through our own savings, voluntary and involuntary, or secure it from external sources. The external sources, however, are not all so obliging, the reasons being our inability to afford the high rates of interest that obtain in the world market and also considerations that have to do with our home and foreign policies. As regards labour, it varies in direct proportion to population. India's population is growing, at least, at the mean rate of the last decennium, *viz.* 1.3 per cent per annum or about five million yearly and, over the foreseeable future or several decades to come, will continue to grow.

Now, some estimable persons consider that production per head will increase as a result of population increase *per se*—that, in the words of Acharya Vinoba Bhave, man need not starve be-

cause while God has given him only one mouth to eat, He has equipped him with two hands to work. That is why the huge population of India or China is sometimes referred to by some economists as 'human resources'—as an asset, and not a liability. They see in over-population a favourable condition for the establishment and success of industrialism: for, every expansion in population is a potential expansion in the markets. To a layman, however, each hundred million of people in India would seem to make the conditions harsher, not better for the other hundreds of millions of them.

Says Elmer Pendell:

> A curious malapropism—a distortion of language is seen occasionally in recent years in the term 'human resources'. The expression probably originated because of its emotional tone: a seemingly complimentary connotation in classifying human beings as resources, because resources are helpful. But most human beings are, in net effect, the opposite of helpful. A resource is a basis of benefits. When people are in excess numbers, any random portion of them is, for the rest of them, exactly the opposite of a basis of benefits. They constitute not a resource but a liability.[1]

The statement of Colin Clark on page 160 suggests that an increase in population will itself increase productive power per head of population, irrespective of capital or other requirements. Labour itself is capital, Lord Keynes has said, inasmuch as until the point of full employment is reached, labour put to use is investment which creates its own equivalent amount of 'saving.'

The proposition is, however, not true in all circumstances. In highly developed or industrialised countries unemployment usually arises not out of a shortage of capital or equipment but of effective demand. A growing population may, therefore, provide an incentive to investment making it easier to approach a position of full employment or recover from depression and, thus, constitute a source of capital. But in India and other under-developed countries, which have a dense agrarian economy, the nature of unemployment is different. Here jobless labour does not exist side by side with unused productive resources or equipment. These countries suffer from a surfeit of labour supply relatively to their resources in land and capital. Their unemployment is thus largely under-employment which originates in a disproportion between different factors of production rather than in a shortage of effective demand. In our country, therefore, the problem of full utilisation of labour is related not to increasing effective demand or utilisation of idle capital and equipment but to the removal of under-employment which, in a predominantly agricultural economy and a social structure based on the joint-family system. takes the form of seasonal and disguised unemployment. Any

[1] *Population on the Loose:* Elmer Pendell, New York, 1951, pp. 4-5.

increase in our population *per se* will not constitute an asset or a capital resource but a definite liability. It will tend to reduce output per head.

In developed countries there is no lack of fixed capital and, the wages-fund being already there, putting the unemployed labour force to work does not result in inflation. An increase of population in these countries tends to increase inflationary pressures only when there is already full employment. But in a backward country where the fixed capital itself is scarce or non-existent and has to be built up through a laborious process there would be a considerable time-lag between the input of labour and the flow of output, that is, a considerable time-lag between the creation of a wages-fund and the resultant savings. Therefore, simply putting the unemployed labour force to work or employing all the hands that continually come into existence as a result of population-increase, will involve a large measure of inflation. The problem of putting the unemployed labour force to work is precisely the problem of finding sufficient wages-fund to support labour during the time new machinery and factories are built up. "The Keynesian view that deficit financing may, under certain circumstances, be necessary and desirable to utilise idle resources of a country, does not hold good in this country as our only important idle resource is unemployed and under-employed labour in the villages, and it cannot be mobilised for productive purposes merely by the issue of currency notes".[1]

To the extent, however, this idle and semi-idle labour in the villages can be utilised without payment of wages as community projects in our country have proved, there need be no wages-fund or only a very meagre fund and, therefore, no inflation. Individual capital formation consists, as Horace Belshaw[2] points out, in putting the farmer or artisan in the position to improve the farm or home or make improved machines and implements. Collective capital formation may be applied for a wide variety of purposes: roads, ponds, wells, irrigation dams and canals, flood protection works, contour and other soil conservation practices, as well as the improvement in amenities through the construction of communal buildings, village sanitation and so on. These types of capital formation require technologically only very small amounts of equipments. They can be constructed with the maximum of labour and minimum of capital resources. In fact, in some cases, the large supply of seasonally idle labour may obviate the use of machinery and other capital in the process of capital creation altogether, especial-

[1] *Some Aspects of Population Problem of India* by Gyan Chand, published by Patna University, Bihar (India), 1956, p. 133.

[2] *Population Growth and Levels of Consumption*, 1956, Chapter VIII.

ly in respect of public works. In others, some finance capital may be required by way of loans or grants-in-aid. Only the people must want the things for which the capital is used or be persuaded to want them. They have to be made aware of the potentialities for betterment in the reservoir of labour power lying unutilised today. The labour power is already there and the road or irrigation dam might be required. Yet it might never have occurred to the villagers that the means are at hand.

Seen in this light, the problem is primarily one of organisation. In our villages where there is greater social integration and the element of common advantage is easier to demonstrate, this should not present a great difficulty. If wages have at all to be paid, in view of the fact that a large supply of idle labour is almost always available, the wages paid need only be subsistence wages. In using methods of capital construction described above there will, thus, be little or no inflationary effect.

In the ultimate analysis, however, it cannot be forgotten that capital is a product of labour put to work on physical resources. In order that the unemployed labour force may be put to work, there must be unutilised physical resources. Capital or machinery cannot be created by men simply out of nothing or with hands having nothing to work upon. Achievements of the community projects and *shramdan* in India notwithstanding, financial resources can be constructed only out of physical resources. It is the extent of its physical resources relative to its human 'resources', therefore, that will, along with innovations, finally set the pace to the economic development of a backward country.

That is why the proposition, that all that is needed for production per head to rise is to for population to increase, has till now been demonstrated only in pioneer societies or under-developed countries having abundant unused resources but a sparse population like the USA in the nineteenth century. There are a few countries still, located chiefly in Africa and Latin America, which are in the increasing returns stage, where a larger population would mean better use of public utilities such as transport and communications, electricity, gas and water, and of facilities for some of the factory or manufacturing industries such as those which process the metal ores and make basic chemicals. In such countries an increase in population in excess of capital will be associated with marked economies and a larger output per head, as both are applied to readily available land and other resources or equipment.

At the same time, however, in order to make progress, the population must be actuated by a spirit to improve its economic conditions and, therefore, actuated by a propensity to innovate.

Horace Belshaw makes two pertinent observations on the statement of Colin Clark—

> (i) If increasing returns to population had applied, an increase in population in India and other under-developed countries might have been expected to lead to increasing income per head and the problem of economic development would have been solved already. In fact, production per head has increased little, if at all, in such countries despite some increase in capital and some technological improvement. This leads to a strong presumption of decreasing factor returns to population growth *per se*, and no economies of scale to population growth of itself.
>
> (ii) The reference to the density of population in North America and Europe does not quite hit the target; some degree of population density in these areas would be necessary for optimum economies of scale; but beyond this diseconomies may well arise. While a large and dense population may be necessary for optimum economies, a larger and denser population may bring no further advantages, and indeed bring disadvantages. Moreover, it may well be that the economies result not from the demographic situation but from this situation plus something else. Population in some under-developed countries is larger and denser than in some of the developed countries,[1] and in terms of these demographic factors alone might derive economies of scale equivalent to those in the areas referred to; but the something else is lacking. *The question at issue, however, is whether further increases in population would result in increasing returns in under-developed countries, i.e. whether output per head would be higher with a faster than with a slower rate of population increase.*[2]—Italics ours.

Horace Belshaw's 'something else' is no other than capital and technological innovations. With a growing population, income or output per head will ordinarily rise only if the rate of growth in capital or of improvements in technology is greater than the rate of growth in population. When this situation is reached in an agricultural country, that is, when income per head increases, whether because capital increases more than in proportion to labour, or because of innovations, this is likely to change the structure of the economy so that manufacture and tertiary services are relatively more important and agriculture is relatively less important. In other words, when total farm production is able to keep ahead of population increase, then alone will our dream of industrialisation or development of non-agricultural resources be realised, and not because we possess vast 'human resources'.

Knowing, however, that a large part of technological innovations will themselves require capital, and knowing further that population is likely to increase although physical resources are more or less inelastic, at least both over the short and the medium period,

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[1] Vide table XIX on pp. 101-103.
[2] *Ibid.* pp. 72-73.

economic development is seen to be primarily a function of the rate of capital formation. But this growth in capital formation requires a corresponding increase in savings. Savings are, to state it in a homely way, the difference between what one earns and what one eats. In a country of dense agrarian economy, therefore, where levels of consumption are close to the subsistence level, an increase in savings will not be easy to bring about.

It is the ratio between our huge population (with its potential growth) on the one hand and natural resources and capital on the other, that the advocates of rapid large-scale industrialisation or intensive capital structure in the industrial sector are apt to overlook. The point of time in world development at which we have arrived on the stage, when people and resources of other lands cannot be exploited and foreign markets are not so readily available, is also a relevant factor; as also our way of life, *viz.* a democratic constitution which we have given ourselves and which precludes exploitation even of our own people beyond a point. It is these considerations which make advocates of high capital-intensive enterprises or heavy industries wrong and those of low capital-intensive, decentralised industries right.

The economically advanced countries of today, whether those which had an earlier start and achieved industrialisation in the nineteenth century, or those which joined the race later and became industrialised only recently, can be divided broadly into two classes, —those which had a high population density relative to natural resources, and others which had comparatively a low population density relative to resources.

Of natural resources land is the most important. In fact, as stated at the outset of this book, it is the source of almost all wealth. For the convenience of readers, figures for various countries relating to total population, usable land resources per capita and percentage of labour force engaged in industry and service sectors are put together in the table on pages 171-172 even at the risk of repeating most of them.

Countries like Netherlands, Belgium, Japan, UK and West Germany do not possess much land resources relative to their population. In fact, the land-man ratio in these countries is lower than in India. Yet they are economically advanced because they had grabbed colonies and dependencies, thus making up for lack of resources at home. The industries in these countries (as in a few others) were built up on the exploitation of the vast natural and human resources of the territories held in subjection. Industrial development in these countries would not have been possible, had it not been for the existence of less industrialised countries and

TABLE XXIX

Statement showing Population and Availability of Land per capita and Percentage of Labour Force engaged in Industry and Service Sectors

In Cents (1 cent =0.01 acre)

Countries	Population in thousands (Year)	Arable land and land under tree crops	Permanent meadows and pastures	Forests and wood lands	Total of cols. (3),(4) and(5)	Percentage of labour force engaged in industry and service sector (year)
1	2	3	4	5	6	7
1. Netherlands ...	9,625.4 (1947)	24	31	6	61	80 (1947)
2. Belgium ...	85,120.2 (1947)	29	20	17	66	80 (1930)
3. Japan ...	89,275.5 (1955)	15	4	66	85	55 (1954)
4. UK ...	50,225.2 (1951)	36	59	8	103	95 (1951)
5. West Germany	47,695.7 (1950)	44	28	35	107	79 (1954)
6. India ...	356,879.4 (1951)	93	6	30	129	26 (1951)
7. Italy ...	47,158.7 (1951)	81	26	29	136	59 (1954)
8. Switzerland ...	4,715.0 (1950)	22	88	50	160	79 (1941)
9. China ...	582,603.4 (1953)	49	103	45	197	...
10. Denmark ...	4,281.2 (1950)	155	21	25	201	71.1 (1940)
11. France ...	42,843.5 (1951)	124	71	66	261	72 (1954)
12. Norway ...	3,278.5 (1950)	61	16	551	628	64.6 (1946)
13. Sweden ...	7,041.8 (1950)	131	32	792	955	79 (1950)
14. USA ...	150,697.4 (1950)	299	395	389	1,083	87 (1950)
15. Mexico ...	25,791.0 (1950)	179	645	372	1,196	39 (1950)
16. Chile ...	5,933.0 (1952)	158	396	679	1,233	...
17. USSR ...	170,467.2 (1939)	268	148	1,098	1,514	43
18. Union of South Africa ...	12,667.7 (1951)	164	1,664	19	1,847	51 (1946)

(Contd.)

TABLE XXIX—(*Concld.*)

Countries	Population in thousands (Year)	Arable land and land under tree crops	Permanent meadows and pastures	Forests and wood land	Total of cols. (3),(4) and (5)	Percentage of labour force engaged in industry and service sector (Year)
1	2	3	4	5	6	7
19. New Zealand ...	21,174.1 (1956)	60	1,620	1,053	2,733	82 (1951)
20. Brazil ...	51,976.3 (1950)	96	512	2,283	3,091	39 (1950)
21. Argentina ...	15,893.8 (1947)	466	1,759	2,643	4,868	73 (1940)
22. Canada ...	14,009.4 (1951)	691	388	6,029	7,108	81 (1951)
23. Australia ...	8,986.5 (1954)	559	10,385	543	11,487	83 (1947)

Source: Table nos. XX, XXIV, XXV, and XXVI of this book appearing on pp. 77-78, 141-142, 147-149, and 150-151 respectively.

newly opened territories together with the predominance of free trade. Prosperity in these countries resulted from (i) the draining off of excess people to the New World and other colonies, (ii) the stimulation of sales of manufactured goods in new areas, and (iii) the flow of cheap food and raw materials to them.

The development of the age of inventions or success of the Industrial Revolution in England or Western Europe depended not simply on some special and unaccountable burst of inventive genius in the English or European races, but on the accumulation of a sufficient fund of capital. The introduction of expensive implements or processes involves a large outlay, and it is not worth while for any man, however enterprising, to make the attempt unless he has a considerable command of capital, and has access to large markets. Both the capital and the markets were supplied by the colonies and dependencies of European countries spread all over the world. In the case of England it was India which largely played this role.

Says Brocks Adams:

> The influx of the Indian treasure, by adding considerably to England's cash capital, not only increased its stock of energy, but added much to its flexibility and the rapidity of its movement. Very soon after Plassey, the Bengal plunder began to arrive in London, and the effect appears to have been instantaneous; for all the authori-

ties agree that the 'industrial revolution', the event which has divided the nineteenth century from all antecedent time, began with the year 1760. Prior to 1760, according to Baines, the machinery used for spinning cotton in Lancashire was almost as simple as in India: while about 1750 the English iron industry was in full decline because of the destruction of the forests for fuel. At that time four-fifths of the iron used in the kingdom came from Sweden.

Plassey was fought in 1757, and probably nothing has ever equalled in rapidity of the change which followed. In 1760 the flying shuttle appeared, and coal began to replace wood in smelting. In 1764 Hargreaves invented the spinning jenny, in 1776 Crompton contrived the mule, in 1785 Cartwright patented the powerloom, and, chief of all, in 1768 Watt matured the steam engine, the most perfect of all vents of centralising energy. But though these machines served as outlets for the accelerating movement of the time, they did not cause the acceleration. In themselves inventions are passive, many of the most important having lain dormant for centuries, waiting for a sufficient store of force to have accumulated to set them working. That store must always take the shape of money, and money not hoarded, but in motion. Before the influx of the Indian treasure, and the expansion of credit which followed, no force sufficient for this purpose existed; and had Watt lived fifty years earlier, he and his invention must have perished together. Possibly since the world began, no investment has ever yielded the profit reaped from the Indian plunder, because for nearly fifty years Great Britain stood without a competitor. From 1694, when the Bank of England was founded, to Plassey (1757) the growth had been relatively slow. Between 1760 and 1815 the growth was very rapid and prodigious.[1]

The British Labour leader, Mr. Aneurin Bevan declared in New Delhi on April 2, 1957 that there would have been a revolution in Britain long ago, if the colonies were not available to relieve the stresses and strains caused by urban industrialisation and consequent disruption of life in the countryside.

These opportunities are not open to us. The ethics of the matter apart, we have no colonies or dependencies to exploit. And all under-developed countries are trying to make up the lee-way so that soon there will be left few or no external markets to buy our industrial goods. Capital or means for India's large-scale industrialisation, therefore, will have to be found from within the country itself, that is, from our own savings.

The last twelve countries mentioned in the table on pages 171-172 possess immense land resources of their own—resources far greater relatively than India. Of these, seven, *viz.* Norway, Sweden, the USA, New Zealand, Argentina, Canada and Australia have already achieved a high degree of industrialisation. Their resources not

[1] *The Law of Civilization and Decay*, pp. 259-60 quoted by R. P. Dutt in *India To-day*, 1949, People's Publishing House, Bombay, pp. 107-108.

only produced raw materials that fed the factories, but food in quantities that left a surplus over rural requirements to feed industrial workers and those engaged in capital formation. This surplus also increased the income of rural populations—which initially constituted a high percentage of the total—so that they could buy industrial goods.

Two of these twelve countries, *viz.* the Union of South Africa and the USSR are still in the midst of economic transformation and the peak justified by their natural resources has yet to be reached. The remaining three, *viz.* Brazil, Chile and Mexico, are still poor and undeveloped. Judged by our reasoning, they are also destined to achieve great economic progress, sooner or later.

There is no complete inventory of mineral resources that the various countries may possess. Yet, we may use available data to indicate our relative position in respect of the more important ones. The minerals which are used in, by far, the greatest physical quantities in manufacturing industry, transport, etc., as a whole, are coal, iron ore and petroleum. Coal is essential in the production of steel, and steel in fabrication of most machines. For several countries more than one figure for a mineral reserve has been given in table XXX because they relate to estimates, not to proved actuals, and, therefore, vary according to sources.

It is clear that we are not as richly endowed by nature as many of us think. Our economic potentiality is not of an order which may be comparable with the USA or the USSR. China is the only country with which India can be compared. While she possesses less arable land per capita, the usable land resources, as a whole, per capita in China are greater than in India. While China possesses more coal, India possesses more iron.

The USA had nearly three times the land area and less than half the population, *viz.* 46 per cent of India (it was much less a hundred years ago).[1] Her usable land resources per capita are more than eight times those of India. As one of the consequences of this land-man ratio in the two countries, the USA can afford to have large-scale farming, that is, produce enough food for herself and more without putting or forcing too many persons on land, whereas India cannot do without intensive farming under which relatively more persons are employed on the same area. As evidenced by the last table USA's mineral and other physical resources were also vast. The rate of capital growth was, therefore, far higher in the USA

[1] The USA (including Alaska) had an area of 36.10 lakh sq. miles compared with 12.70 lakh of India, and, at the end of 1956, a population of 168 million as compared with 387 million of India.

TABLE XXX

Statement showing Estimates of Reserves of Important Minerals

Sl. No.	Name of the Country	Year	Population in '000	Coal (including Lignite)		Iron Ore		Petroleum	
				Estimated reserves (m. tons)	Per Capita reserve (tons)	Total estimated reserves (m. tons)	Per Capita reserve (tons)	Total estimated reserves (m. barrels)	Per Capita reserve (barrels)
1	2	3	4	5	6	7	8	9	10
1	India*	1952	367,000	42,649*a* 45,423*h* 79,000*b*	116.21 123.77 215.26	21,240*b* 10,137*i*	57.87 27.62	300*d*	0.82
2	USA	1953	159,629	24,00,000*g*	15034.86	25,488*b* 3,800*i*	159.67 23.81	24,702*g* 30,500*d*	154.75 191.07
3	Canada	1951	14,009	30,819*a* 100,000*g*	2164.25 7138.27	2,221*b* 1,500*g*	158.54 107.07	1,200*h* 3,600*d*	85.66 256.98
4	Mexico	1950	25,791	...	.....	189*b* 100*i*	7.33 3.88	850*h* 2,500*c* 3,000*d*	32.96 96.93 116.32
5	Argentina	1947	15,894	50*a* (probable)	3.15	32*b*	2.01	250*g* 350*c* 2,300*d*	15.73 22.02 144.71
6	Australia	1952	8,649	20,900*a* 20,000*g*	2416.46 2312.41	198*b* 400*i*	22.89 46.25	.....	.....
7	Union of South Africa ...	1953	13,153	7,914*d* 200,000*h*	601.69 15205.65	5,089*b* 1,000*j*	386.91 76.03	.....	.....
8	United Kingdom	1953	50,857	129,500*a* 190,000*g*	2,546.36 3,735.97	918*b* 3,100*i*	18.05 60.96	7*d*	0.14
9	France	1952	42,545	6,000*ag*	141.03	9,333*b* 4,500*i*	219.37 105.77	150*d*	3.53

(*Contd.*)

Table XXX—(*Contd.*)

Sl. No.	Name of the Country	Year	Population in '000	Coal (including Lignite)		Iron Ore		Petroleum	
				Estimated reserves (m. tons)	Per Capita reserve (tons)	Total estimated reserves (m. tons)	Per Capita reserve (tons)	Total estimated reserves (m. barrels)	Per Capita reserve (barrels)
1	2	3	4	5	6	7	8	9	10
10	Germany (West)	1950	48,994	80,440*a* 110,000*g*	1,641.83 2,245.17	840*b* 1,250*i*	17.14 25.51	365*d* 540*g*	3.06 7.45
11	Italy	1953	Under 47,756	1*a* 1,000*g*	0.02 20.94	30*b* 60*i*	0.63 1.26	200*d* (including Sicily)	4.19
12	Sweden	1953	Under 7,171	97*a* 1,000*g*	13.53 139.45	1,000*b* 1,250*i*	139.45 174.31	.....	.....
13	Norway	1953	3,359	11,000*g*	3274.78	738*b* 300*i*	219.71 89.31	.....	.....
14	USSR	1951	207,000	293,900*a* 15,00,000*g*	1429.47 7246.38	4,345*b* 3,100*i*	20.99 14.98	4,300*h* 23,000*d*	20.77 111.11
15	China	1947	463,198	444,000*e*	958.55	1,215*b* 4,168*e*	2.62 9.00	750*d*	1.63
16	Japan	1951	84,300	5,895*a* 6,500*e*	69.93 77.11	38*b* 24*i*	0.45 0.28	25*d*	0.30
17	Indonesia	1947	76,360	500*e* (Proved reserves)	6.55	720*b*	9.43	1,100*h* 3,000*d*	14.41 39.29
18	Belgium	1953	8,778	11,000*a*	less than 1253.13	62*i* 50*b*	7.06 5.70	.....	.....
19	Netherlands	1953	10,403	212*a*	20.20*a*	1,500***b* 100*i*	142.95 9.53	..... 110*c*	..... 10.48

(*Contd.*)

Table XXX—(*Concld.*)

20	New Zealand	1953	Under 2,047	560*a* 1,000*g*	273.57 488.52	less than 50*b*	24.43	.....	.....
21	Brazil	1950	51,976	.....	.....	4,000*i*	76.96	.....	.....
22	Chile	1952	5,933	5,000*g*	842.74	120*i*	20.23	.....	.....

*According to Dr. R. C. Misra, Head of the Department of Geology, Lucknow University, the figures of 45,423 million tons for coal and 21,240 million tons for iron-ore reserves seem to be more likely.

**Figures relate to Netherland Indies.

Source : (*a*) (*i*) *India's Resources* by V. P. Sondhi and D. R. S. Mehta, 1957

(*ii*) *Bulletin of Economic Minerals* XVI by E. R. Gee

(*b*) (*i*) *World Iron Ore Resources and Their Utilization*, U.N.O. Publication, 1950

(*ii*) Figures of possible reserves according to—

(*i*) *Iron Ore of India* by Dr. M. S. Krishnan, (1958), p. 150 ;

(*ii*) *Geology of India*, May, (1957), p. 7, a pamphlet published by the Ministry of Information and Broadcasting, Publications Division, Government of India; and

(*iii*) *The Progress of the Mineral Industry of India*, (1951), published by the Mining, Geological and Metallurgical Institute of India

(According to these sources the proved reserves of iron ore are only 6,421 million tons)

(*c*) *Indian Minerals, Vol.* XI, No. 2 (Reserves for 1955)

(*d*) *World Petroleum Report* (1958)

(*e*) *Development of Mineral Resources in Asia and the Far East* (1953)

(*f*) *Economic Mineral Deposits* by Allen M. Bateman (1952) and 12th International Geological Congress, Canada, 1913

(*g*) *Mineral Resources of the World* by Von Royen, Bowels and Prehson (1952)

(*h*) *Bharat Me Koyle Ke Sansdhan* by Chintamani Tripathi, published in the *Indian Minerals, Vol. II*. No. 2. (June 1957)

(*i*) Figures of total estimated reserves according to *Proceedings of U. N. Scientific Conference on the Conservation and Utilization of Resources* (1951) and *Records Geological Survey of India, Vol.* 85, II, (1954), p. 264

than it can possibly be in India. Obviously, then, we cannot hope to develop in the same way as the USA did.

As the advocates of industrialism point out, our huge population does constitute a tremendous potential internal market. Once purchasing power of our people is raised, their own manufactures will not be sufficient to meet the pent-up demands of four hundred million customers or more for a long time to come. But this purchasing power cannot be developed in a day or by rush methods. We will have to produce more food, with fewer people on the land —food sufficient to feed the farmers and those who have gone to the factories. Farm surpluses are required to provide the farmers with purchasing power with which to buy the goods that factory-workers will be producing. Then alone will we be able to develop our internal market, not earlier. But this consummation will require a far greater application of capital to land, and improvement in farming methods than we possibly imagine, and than we have hitherto been able to ensure. Anyway, unless increased food production per acre can be achieved, there is no reasonable hope for India to achieve any marked improvement in her economic conditions by manufacturing, because there is too little market anywhere in the world for the things she might manufacture, and our farmers will not be having the wherewithal to buy the products manufactured by their countrymen.

Although late in the day, the Russian people also, like the Americans, entered on their period of economic development (1914-44) with a low density of persons relative to resources, which gave them a high potentiality for rapid industrial progress compared with many other nations in the world. But, actuated by their belief in big economic units which Communism inculcates and their desire to outstrip the West in shortest possible time, they started building the 'biggest' and the 'most up-to-date' factories, some of which were so colossal that they were not finished till 8 or 10 years later. This required a huge amount of capital which was locked up and, for all practical purposes, lost during this period. It was with a view to find capital for these industrial giants that collective farms were established which meant enormous suffering for the masses that could, perhaps, have been avoided.

The People's Republic of China has followed suit, and does not make secret of the purpose behind her agrarian co-operatives. The primary aim of agrarian co-operatives in China, which is only an initial name for collective farms, is officially declared to be the accumulation of capital for industrialisation by increasing the marketable surplus of foodgrains.

In an article entitled *Develop Agricultural Co-operation to Accumulate Capital for the Industrialisation of the State*, Chang Ching-Tai said in the Communist theoretical journal, *Hsueh Hsi* ('Study'), dated December 2, 1955:

> The development of industry, particularly the development of heavy industry, needs a colossal amount of capital, which must be earned over a considerable period of time. As we all know, the capital needed for our own industrialisation can only come from accumulation within our own country, and accumulation in the agricultural field is an important factor. Due to our technical backwardness, many kinds of modern industrial equipment and various heavy-type or precision instruments cannot yet be produced in the country and they must be imported from abroad, first, from our fraternal countries. To import these things, we must first organise exports. At the moment when our industry is still backward, our major exportable goods are only agricultural produce, native goods and minerals. It will thus be seen that the development of agricultural production is of great significance for the support of the industrialisation of our State.
>
> However, the present situation is that the development of agriculture does not fully satisfy the needs of industrial development. As an example, the rate of the increased output of marketable grain is very low. Many light industries, for the lack of sufficient supply of raw materials, cannot make the fullest use of their machinery equipment. If such conditions continue, the speed of industrialisation must be affected.
>
> Our agricultural development is backward because today the small peasant economy still occupies an important proportionate share in our agricultural economy. The sole means to solve this question is to lead the small peasant economy to the road of co-operation.... According to the data collected from various areas, the existing agricultural producers' co-operatives in our country, during the first one or two years of their formation, have registered a production increase of between 10 and 20 per cent. Generally speaking, the output of co-operatives is higher than that of mutual aid teams, and, of course, much higher than that of the individual peasants.

The reader will recollect with interest that some of the reasons advanced by the Patil Delegation in favour of co-operativisation of agriculture in India sound like a paraphrase of the arguments given in the above article from the Chinese journal.

The article was written in 1955; by the end of 1956, 96 per cent of the Chinese peasantry had been organised into co-operatives, of which two-thirds were of the 'advanced' type or collectives. We have, however, already seen that pooling of land cannot by itself lead to increased production. People in China have been led into Co-operatives or Collectives just as they were in the Soviet Union, and in exactly the same stages: first, confiscation of land and phy-

sical liquidation of landlords; then, its distribution into small bits and loud professions of support to peasant economy; the discovery that peasant economy, which is after all a capitalist economy, breeds individualism and leads to inefficient production; encouragement of peasants' societies where at first labour and livestock alone are pooled; then land also till the *kolkhoz* is reached; and, finally, the announcement to the world that the advantages of collective farming were found by the farmers to be so great that they all only too gladly opted, rather rushed into the *kolhozy,* or 'advanced' co-operatives in a 'surging tide.' The reasons for dragooning the peasants into collective farms in Soviet Russia were similar, *viz.* the collective farms will be in the grip of the State and will be forced to yield farm produce to the State at rates far lower than those prevailing in the market. This produce will be sold in the cities or the outside world at far higher rates, and the difference will go towards purchasing equipment for heavy, large-scale industries. An economy of millions of independent peasants could not be made to yield these compulsory deliveries, misnamed 'surplus produce' to the State.

There is, however, one important point in which China differs from the USSR: the land-man ratio is far lower. The Soviet Union had a much smaller population, more unused resources and virgin land. China has no such areas of land to develop except some patches here and there. The Chinese Government's aim of finding capital for rapid industrial growth from land through collectivisation or communisation which is the latest development, will, therefore, hardly be realised.

To turn to India: Our circumstances differ from every other country that has been mentioned. We have neither an abundance of physical resources relative to population nor colonies and dependencies to exploit; further, almost every country in the world has now entered the competition for rapid economic development and we are, in a way, burdened with a fully democratic Constitution. India, therefore, has to develop her own economic theory, keeping in close touch with the realities of the situation.

Although it is now about a century that India set out on industrialisation, yet, in view of the fact that she was politically subject and, therefore, not free to build up as she would, she is still in the first stage of industrialisation. The major emphasis in her industrial development till now has been on consumer goods industries. We may, therefore, regard 1947, the year of her independence, as the starting point of her industrialisation in earnest. Now, it would appear that with the exception of Japan which had, at the

beginning of its industrial expansion (1870), a density of about 1,500 per square mile of arable land, India has a population more crowded than that of any country on the eve of its industrialisation, *viz.* 649 per square mile of arable land. That a dense agrarian economy tends to impede industrialisation, there can be no doubt. For, the extent of industrialisation is in a large measure determined by the degree to which machinery is substituted for human labour and in a dense agrarian economy, labour is, at least, immediately cheaper than machinery.

The amount of land per cultivator in India is steadily declining, which tends to increase poverty, to limit investment in the soil and thus to hold down productivity. If personal labour is taken into account, farming is a deficit undertaking in many parts of the country, and the mass of the people have no alternative source of income. Further, a high ratio of farm population to agricultural resources means that most of the land is devoted to food crops for sustenance rather than to export crops for an investment surplus or to crops that provide raw materials for industries. The situation reaches its ultimate futility when agricultural productivity is so low or food requirements of the swollen population so great that an agricultural country becomes an importer of agricultural produce.

The masses are so greatly deprived of the immediate necessities that all the pressures are on the side of more and immediate personal consumption and thus everything is expended on sheer maintenance of life. As bare necessities are met, further increases are made to the population so that the supply of immediate necessities must be constantly expanded. This leads to a situation where the future has to be sacrificed for the present—a situation which makes it hard to accumulate any surplus at all, much less the surplus necessary to develop an industrial system of high capital-intensity.

Below is given a table consisting of two parts prepared on the basis of information contained in the UN Bulletins of Monthly Statistics and various issues of *International Finance Statistics*, issued by the IBRD. For eighteen countries in Part I, estimates of net capital formation cover the whole economy. For sixteen countries in Part II, the estimates relate to capital formation in the private sector only. Recent rates of population growth also for all the countries are given side by side. It will be seen that the ratio of capital formation to population growth in India is relatively very low—

TABLE XXXI

The Rates of Capital Formation and Population

PART I

Name of Country	Net Capital Formation as percentage of National Income (1)					
	1950	1951	1952	1953	1954	1955
1	2	3	4	5	6	7
1. Argentina	13.5	16.6	14.5	7.1	11.5	N.A.
2. Brazil	9.9	13.4	15.5	12.7	16.2	N.A.
3. Canada	19.0	21.7	18.5	19.7	14.0	18.3
4. Colombia	6.7	9.4	6.8	8.8	8.0	N.A.
5. Cuba	7.3	7.0	13.1	3.0	9.6	N.A.
6. Denmark	18.2	14.1	14.4	15.4	15.1	N.A.
7. Ecuador	6.3	9.6	6.4	10.4	11.6	N.A.
8. France	12.6	10.9	11.4	9.5	10.6	11.8
9. Germany (West) ...	18.1	22.3	20.4	21.0	21.7	24.0
10. Greece	19.9	17.3	11.1	13.0	11.3	13.8
11. India	4.9	7.3	4.5	4.6	6.6	7.3
12. Ireland	13.1	16.3	12.6	13.8	12.1	14.3
13. Japan	22.8	30.5	24.8	25.7	19.4	21.0
14. Netherlands ...	24.1	19.1	10.3	15.4	22.1	20.6
15. Norway	21.2	23.1	21.4	21.3	22.9	23.1
16. Philippines	3.8	2.7	2.8	3.3	3.8	N.A.
17. Sweden	19.1	22.1	22.2	21.1	23.3	N.A.
18. U. K.	3.8	9.6	5.4	6.8	8.6	9.2

Source :—(1) U. N. Bulletin of Monthly Statistics, October, 1956.

Growth for Various Countries from 1950-1956

PART I

Name of Country	Percentage Growth of Population over the preceding years (2)						
	1950	1951	1952	1953	1954	1955	1956
1	8	9	10	11	12	13	14
1. Argentina	...	2.0	2.3	2.0	1.9	1.9	1.9
2. Brazil	...	2.4	2.4	2.4	2.4	2.4	2.4
3. Canada	...	2.2	3.0	2.4	2.8	2.7	2.4
4. Colombia	...	2.2	2.2	2.2	2.2	2.2	2.2
5. Cuba...	...	2.1	1.9	1.8	...	...	...
6. Denmark	...	0.8	0.7	0.8	0.8	0.7	...
7. Ecuador	...	3.0	3.0	3.4	3.0	3.0	2.8
8. France	...	0.8	0.7	0.7	0.7	0.8	0.8
9. Germany (West) ...	...	1.2	0.8	1.1	1.1	1.0	...
10. Greece	...	1.1	1.1	1.0	1.0	0.9	...
11. India	...	1.3	1.2	1.2	1.2	1.2	...
12. Ireland	...	(—).3	(—).4	(—).1	(—).4	(—).8	(—).5
13. Japan	...	2.8	1.4	1.4	1.5	1.3	1.0
14. Netherlands ...	...	1.5	1.1	1.1	1.2	1.3	1.3
15. Norway	...	0.9	0.9	1.0	1.0	1.0	...
16. Philippines	...	1.9	1.9	1.9	1.9	1.9	1.9
17. Sweden	...	0.8	0.7	0.6	0.6	0.7	0.6
18. U K	...	(—).046	0.3	0.3	0.3	0.4	0.5

Source :—(2) U. N. Bulletin of Monthly Statistics, March 1957.

PART II

Name of Country	Gross Private Capital formation as Percentage of Gross National Income (1)						
	1950	1951	1952	1953	1954	1955	1956
1	2	3	4	5	6	7	8
1. Australia	N.A.	26.3	34.6	14.4	21.6	25.5	23.6
2. Austria	17.9	24.2	21.6	12.5	15.1	23.4	N.A.
3. Belgium	16.6	16.5	15.7	15.3	15.8	N.A.	N.A.
4. Burma	9.4	12.0	15.6	16.0	17.4	17.5	16.7
5. Ceylon	5.0	7.0	6.8	5.3	4.4	N.A.	N.A.
6. Chile (*a*)	6.5	4.3	0.4	4.2	N.A.	N.A.	N.A.
7. Finland	23.4	24.8	27.9	24.3	27.7	24.2	N.A.
8. Gautemala	8.6	11.6	10.0	12.5	16.9	15.0	N.A.
9. Honduras	13.0	15.9	16.7	N.A.	N.A.	N.A.	N.A.
10. Italy	24.0	26.1	25.3	24.0	25.5	27.6	N.A.
11. Luxemburg	34.0	21.2	21.3	33.5	31.3	N.A.	N.A.
12. New Zealand ...	20.1	20.5	17.0	11.3	19.9	19.5	N.A.
13. Panama	14.4	14.3	18.2	10.8	11.9	N.A.	N.A.
14. Peru	22.8	30.2	28.9	26.0	26.7	N.A.	N.A.
15. Puerto Rico (*a*) ...	9.5	13.2	8.8	8.5	11.3	N.A.	N.A.
16. U.S.A. (*a*) ...	12.7	12.0	8.9	7.8	6.4	9.0	N.A.

(*a*) Figures refer to net capital formation only.

Source : (1) I.F.S., March, 1957.

Name of Country	Percentage Growth of Population over the preceding years (2)						
	1950	1951	1952	1953	1954	1955	1956
1	9	10	11	12	13	14	15
1. Australia	...	3.0	2.5	2.1	2.0	2.4	...
2. Austria	...	0.1	0.1	0.1	0.2	0.1	...
3. Belgium	...	0.5	0.6	0.6	0.5	0.6	...
4. Burma	...	1.0	1.0	1.0	1.0	1.0	...
5. Ceylon	...	2.6	2.5	2.7	2.8	2.4	...
6. Chile (*a*)	...	1.8	1.8	2.3	2.5	2.5	2.7
7. Finland	...	1.2	0.9	2.3	1.2	1.2	1.1
8. Gautemala	...	2.8	6.2	2.5	3.3	3.6	...
9. Honduras	...	2.9	2.9	3.4	2.8	3.2	...
10. Italy	...	2.2	0.7	0.5	0.5	0.4	...
11. Luxemburg ...	...	0.7	0.7	1.0	0.7	1.0	...
12. New Zealand ...	...	2.0	4.6	2.6	2.4	2.0	1.7
13. Panama	...	2.6	2.7	2.7	2.6	2.7	2.7
14. Peru	...	2.0	2.0	2.0	2.0	2.0	2.2
15. Puerto Rico (*a*) ...	...	1.2	(—).3	(—).4	0.7	1.5	...
16. U.S.A. (*a*)	...	1.8	1.7	1.7	1.7	1.8	1.7

(*a*) Figures refer to net capital formation only.

Source:—(2) U. N. Bulletin of Monthly Statistics, March 1957.

The population of India is growing at the mean rate of, at least, 1.3 per cent per annum. If we assume a capital output ratio of 3 : 1 for the entire economy (by and large, taking a number of countries, the ratio lies between 3:1 and 4:1), it will take an investment of Rs. 3/- to produce an income of Re. 1/-. Just to maintain the present standard of living, we need to make an investment of (1.3 x 3) 3.9, or about 4 per cent of the national income annually. An increase of 1 per cent in the output per head will require an additional investment of 3 per cent, *viz.* about 7 per cent in all. So that, calculated by the logarithmic method, at the average rate of capital formation for six years, 1950-55, *viz.* 5.9 per cent and the most favourable rate, *viz.* 7.3 per cent, as evidenced by the table above, we would take 106 years and 62 years respectively to double our present standard of living. If the rate of capital formation rises to 10 per cent, it will take 35 years to do so. These conclusions are subject to the assumption that our rate of population growth does not accelerate. It is time, therefore, that we shed all fond hopes in regard to rapid economic development or industrialisation of the country.

We would do well to note that, as the above table shows, the principal obstacle to economic development or raising output per head in India is not the rate of population growth but the fact that our rate of capital formation is much too low.

The truth has to be faced that India does not possess sufficient physical resources relative to her population and, therefore, relative to her industrial ambitions, and, while a nation can find the financial means to do anything which it has the physical resources to do, no amount of financial jugglery can take the place of the latter. Nor can any mere redistribution of an existing physical asset or product, nor any mere regulation thereof, take the place of expanded production and rising productivity.

There is a source of capital, however, to which we can look for assistance, *viz.* the international monetary market. But there are two limitations on the extent to which we can utilise such assistance. Loans must pay interest. And it is not all kinds of economic or developmental activities that are able to pay their way or necessarily and automatically lead to proportionate improvement in the balance of payments. For example, investment in social overhead like power, communications, transport, water supply, health and education is often a type of investment in which returns are long deferred, and which has a low ratio of output to capital. Similarly, although investments in irrigation or land development will improve nutritional levels, they may not immediately reduce imports or increase exports and thus have only remote and indirect

effects on improving the balance of payments. The second limit is imposed by the necessity to 'marry' the imported capital with local capital formation. This may pose no problem to the extent to which imported equipment (and skill) can utilise our idle and semi-idle labour. But this extent cannot be large or unlimited, and our capacity to absorb foreign capital will ultimately be governed by the rate of our internal savings, which is low.

Foreign capital can take two forms, private and inter-governmental. We should make every effort to stimulate the flow of private funds, although investment of such funds has not succeeded to any marked degree in promoting economic development of the country in the past, and obstacles, such as, the possibility of nationalisation, inconvertibility of currencies and higher returns possible in developed countries stand in its way today. On the other hand, inter-governmental finance is regulated by the foreign policy of the countries concerned. It is seldom that political strings, though they may be remote or indirect, are not attached.

Such being the position with regard to capital formation within the country and availability of capital from outside, and the need for economic development being admitted, the speed and scope of the development call for profound statesmanship on the part of India's leaders.

The goal—a higher standard of living by means of industrial growth—being quite acceptable, it draws popular support for our Five-Year Plans. But as the means, *viz.* high taxes and inflation, become known in detail, they will meet stiff opposition. In a democracy where the government has to win willing co-operation of the electorate, politically it is more difficult to secure these means than in a totalitarian country, where consumption can be cut down to any extent that may be desired by Government and all the savings needed, therefore, raised without difficulty, because the consent of the people is not required. In Russia the peasantry as a whole, the majority of the population, admittedly opposed collectivisation, which was a means of finding capital for heavy industries. Only a dictatorship could have forced through such a programme.

It is hard, indeed, to convince people who are hungering for food, clothes, houses, education and medicine to make sacrifices for basic industries which do not benefit them so immediately. Why, indeed, should people want economic development sufficiently to do something about it, that is, to pay high taxes, if their living standards remain unchanged? Unless the food and clothing of most of them improve at a pace and in a manner perceptible to and approved by them, they will increasingly incline to accept the promises of Communism, little knowing its costs.

Obviously then, the rate of savings must necessarily be low and a policy of rapid large-scale industrialisation is, in the circumstances of our country, fraught with political risks. It is not so easy for a democracy that we are, as it may be for a dictatorship, to enforce the policy of 'Jam Tomorrow' and of keeping the people reasonably contented with make-do goods or none at all on the plea that at the end of another Five-Year Plan, the nation will be all the stronger and all the wealthier.

Prime Minister Nehru observed in a recent speech that in India and other newly independent countries political independence had preceded economic revolution while in Western Europe and the USA the reverse had been true. Long before the masses in the latter countries came into the picture through adult franchise, etc., they had been able to build up their industry and perfect their technique and begun to produce enough resources to meet the demands made by the political revolution. On the other hand, in the former countries which are economically under-developed, people's wants had become pressing before the means to satisfy them became available. While population density and growth hamper economic improvement, people's aspirations have been awakened by the political democracy which they have come to enjoy. They are becoming increasingly conscious of poverty and economic differences. They are becoming impatient.

Perhaps, therefore, except for important qualifications, we need not make haste to set up a capital-intensive structure on the lines of the USSR and, in consequence, to have to rely on forced savings, as she did, to provide us with sinews of investment, and a better balance can be maintained between light and heavy industry. If as a result, industrialisation does not proceed at break-neck speed, it will develop on a sounder basis with less waste and suffering for the people.

CHAPTER XVI

INDUSTRIAL STRUCTURE SUITABLE FOR INDIA

The kind of capital structure that will suit India depends upon the answer to the question as to what do we aim at? If we aim merely at the highest output per person employed, output being positively correlated with capital per head, we must have a capital structure on lines of western industries where this amount is large. But we have three other aims also *viz.* to provide optimum employment, to ensure equitable distribution of the national product and to promote a democratic way of life.

An example showing the relationship between capital and output in the cotton industry will serve to show that, on the whole, it is less capital-intensive structure that meets India's needs best. At present, in India, textile fabrics are manufactured, broadly speaking, by four different methods of production involving an ascending degree of round-aboutness or capital-intensivity (that is, capital investment per head of worker). Firstly, there is the ordinary handloom cottage industry, using crude methods, having low capital-intensivity, giving low output per head and using a large number of workers. Secondly, there is the improved handloom or automatic handloom with higher capital-intensivity, *e.g.* the Salvation Army loom, the Chittaranjan loom and the Hattersley loom. In the Hattersley loom, almost all the motions are automatic and capital-intensivity is also rather high. Thirdly, there is the small-scale industry—single-unit powerlooms worked in cottages and small-loom factories. Fourthly, there is the modern textile mill. Relevant details are roughly as given in the table in the next page.

The figures presented in this table, though they will differ from industry to industry, may be taken to illustrate the broad relationships obtaining as among the various technologies within a particular industry.

The table brings into relief the conflict between two (or three) possible tests, *viz.* output (and employment) per unit of capital and output per head. Different ends seem to compete with each other, but as far as our country is concerned the conflict is not real. As column 3 of the table shows, undertakings of high capital intensity or those employing higher technology produce far more per worker employed than undertakings of low capital intensity or those employing cruder technology. For the same amount of capital in-

TABLE XXXII

Capital and Output in Cotton Weaving in India[1]

Method of Production	Capital intensity (or capital investment per head of worker)	Output (or net value added) per head	Capital coefficient (or ratio of value of output to capital)	Amount of labour employed per unit of capital
1	2	3	4	5
	Rs.	Rs.		
1. Modern mill or large composite factory consisting of spinning-cum-weaving establishments (large-scale industry)	1,200	650	0.54	1
2. Power-loom or small factory consisting of weaving establishments alone (small-scale industry)	300	200	0.66	3
3. Automatic loom (cottage industry) ...	90	80	0.90	15
4. Handloom (cottage industry)	35	45	1.29	25

vested, however, industrial undertakings of low capital intensity produce more goods and provide far more employment than undertakings of high capital intensity. In order to calculate the total output for different types of technologies, one will have to assume a given quantity of capital and multiply it by the capital coefficient as given in column 4 of the table. If this were done, one will find that on an assumed capital of Rs. 1200/-, the output under different forms of technology beginning with the modern mill would be Rs. 648/-, Rs. 792/-, Rs. 1080/- and Rs. 1548/-.

While, therefore, high capital-intensive enterprises may be advantageous to the persons who are employed therein, for they will get higher wages, it is low capital-intensive enterprises that are advantageous to the country as a whole, where capital is scarce (for they require less capital), poverty is extreme (for they yield greater product in the total) and labour is plentiful (for they provide more employment). In our country where capital is much the scarcer factor of production than labour, the optimum adaptation of scarce means to unlimited ends would be achieved only when we use capital-economising and labour-intensive methods of production. In other words, we shall have to use less 'capitalistic' methods of production or cruder technology.

A high capital-intensive undertaking results in keeping a majority of the labour force unemployed or renders them unemployed

[1] A table given in an article by P. S. Loknathan entitled, *Cottage Industries and the Place* published in *The Eastern Economist* dated July 23, 1943, p. 340.

and, at the same time, tends to concentrate wealth in the hands of a few—to concentrate wealth that would have otherwise gone as wages or earnings to small men or workers, into the pockets of the mill-owners as profits. That is why, it would seem, *inter alia,* disparities in incomes in India are so great and, in spite of a fairly larger number of factories, little or no difference in the living standards or levels of consumption of the masses is discernible. In a way, unemployment and consequent misery of millions of persons is the price that the country pays for profits of a few at the top.

The capital coefficient or the ratio of the value of output to the amount of capital used, owing to differences in environment and demand, will differ from industry to industry in the same country and in identical industries with similar capital structure in different countries. As a general rule, however, the coefficient or productivity of capital in industries which use cruder technology, for example, in the cottage and handicraft industries will be higher than in more modern industries which use advanced technology. If the coefficient is higher, output is greater relatively to the amount of capital used and we have economy of capital. In a country like India, where labour is not only abundant but redundant, and capital is scarce and, therefore, the rate of interest higher relatively to the rate of wages—it will not be economical to use the latest, highly automatic, costly machines which require more capital relatively to labour. Here we should expect the structure of economic organisation to be such that the ratio of output to labour would be lower, and that to capital higher, than in economically advanced countries where capital-intensity or capital invested per head of worker is greater.

The test of low capital intensity, however, can be applied only as a general rule to which important exceptions will have to be made. In the ultimate interest of the country it will not be possible to advocate a basic pattern for all industries without qualifications. The capital structure of the economy cannot all be left to be determined by the forces of the free market or the small volume of capital that may be available relative to the large supply of labour. Labour being cheap and machinery relatively costly in the country, the best results for the private entrepreneur in most cases should be obtainable by applying large amounts of labour to a single machine. He will, therefore, left to himself, cut down his costs by selecting labour-using methods in preference to capital-using ones. However, the organisation of labour into trade unions and the various laws governing relations between labour and industry, tend to push up the wages and, in consequence, to make the machines comparatively cheaper. The prophecy of Karl Marx

that the economic condition of depressed classes in industrial societies must progressively deteriorate, has not been fulfilled in Western democracies, simply because workers have organised themselves to exercise political power and do away with the free supply and demand of human labour. This is happening in India also. The entrepreneur, therefore, in actual practice, prefers a higher capital structure, that is, a structure which uses comparatively less labour.

Economic motives or interests of the private entrepreneur apart, however, prime needs and circumstances of the country may require that a large part of the immediately available capital is, in accordance with a plan, diverted or apportioned to a priority list of industries in the public sector on the basis of latest technological methods—to industries which are vital to the community. Industries such as electric power, steel or large public works like railways are cases in point. They make so important a long-term contribution to the economy that they must be undertaken even if the capital coefficient or the ratio of output to capital is comparatively lower. Cement can also be included in the list although its production does not require much capital.

In this age, electric power and steel are the key to economic development, whether it be in the field of large-scale operations, or in the field of cottage industry. Unless there is a great disparity in possession of natural resources and availability of raw materials, there is a broad relationship between steel and energy production on one hand and national income on the other. The table on the next page would show that for nearly all nations a large use of steel and energy means a high standard of living and *vice versa*.

The per capita income of Australia is equal to that of Sweden in spite of the fact that Sweden produces far more electricity than the former, because, as will appear from tables XXIX and XXX, Australia has far more land and far more coal and lignite per capita than the latter. The per capita incomes of Denmark and Norway are equal, although the latter produces more than 7 times the energy than the former, because, *inter alia*, Denmark's per acre production from agriculture (and dairy husbandry) is far higher, perhaps, the highest in the world.

Five countries mentioned in this table used commercial energy in 1953 in the following comparative annual amounts per capita. The figures* are the equivalents of standardised tons of coal, whether the fuel actually used was wood, coal, oil or gas:—

U.S.A.	8.0	Japan	1.0
U.K.	4.5	India	0.1
U.S.S.R. (1950 figure)	1.8		

* Source:—*A Philosophy of Indian Economic Development* by Richard B. Gregg, Navjivan Publishing House, Ahmedabad, 1950, page 3.

TABLE XXXIII

Relation of Production of Crude Steel and Electricity to National Income for 1955

Country	Population in thousands (year)	Per capita production of crude steel (in lbs.)	Per capita production of electricity in (K.W.H.)	National income per capita (U.S. dollars) in years 1952—54
1	2	3	4	5
1. U S A	150,697.4 (1950)	1,553.42	4,168.5	1,870
2. Canada	14,009.4 (1951)	646.62	5,158.7	1,310
3. Switzerland	4,715.0 (1950)	.....	3,276.4	1,010
4. New Zealand	2,174.1 (1956)	.....	2,008.2	1,000
5. Australia	8,986.5 (1954)	550.51	1,702.3	950
6. Sweden	7,041.8 (1950)	672.48	3,510.6	950
7. Belgium	85,120.2 (1947)	152.81	1,315.5	800
8. U K	50,225.2 (1951)	882.67	1,874.1	780
9. Denmark	4,281.2 (1950)	122.56	900.4	750
10. France	42,848.5 (1951)	647.95	1,156.0	740
11. Norway	3,278.5 (1950)	111.63	6,918.4	740
12. West Germany	47,695.7 (1950)	986.20	1,604.8	510
13. Netherlands	9,625.4 (1947)	222.85	1,162.3	500
14. Argentina	15,893.8 (1947)	.....	361.8	460
15. U S S R	1,70,467.2 (1939)	585.85	997.8	400
16. Italy	47,158.7 (1951)	251.97	808.4	310
17. Union of South Africa ...	12,667.7 (1951)	274.97	1,290.8	300
18. Japan	89,275.5 (1955)	232.32	730.2	190
19. India	3,56,879.4 (1951)	10.70	23.8	60

Source :— (1) U N O Statistical Year Book, 1956.
(2) U N O's Statistical Paper, *Per Capita National Products of Fifty-five Countries*, 1952-54 (Series E, No. 4), pp. 8-9.

The wealth of these nations per capita, it will be seen, ranks in the same order.

It may be observed that the increase in national income proceeds at a much slower rate than production of steel and energy. The per capita national income of Australia and USA, for instance, is only 16 and 31 times that of India respectively but their per capita production or consumption of steel is about 52 times and 150 times respectively, and that of electricity about 72 and 175 times. If, therefore, our national income has to be progressively raised, steel and energy production in the country will have to increase far more than proportionately.

Around 1850 Britain's iron production was 1.3 million tons per year. A spectacular effort took this figure to 6 million tons by 1870. Today the iron and steel output of India, at the threshold of her own economic development, is of the same order as Britain's 100 years ago. India's output will rise to 6 million tons by the end of the Second Five-Year Plan, but to rank as an equal in this regard with Britain, India will have to produce 100 m. tons of steel a year. To reach that objective India has reasonable expectations with regard to raw materials. Her iron ore deposits are singularly rich with a metal content of up to 61 per cent as against the 15 per cent to 30 per cent which iron and steel works in other countries find it worth-while to process.

Public investment is also necessary for the development of new industries to which heavy risks are attached and for which very large capital resources are required. Nuclear power is a case in point. India is particularly fortunate in possessing mineral resources of nuclear energy in an abundant measure, which, in course of time, can be developed to great economic advantage of the country.

Similarly, in respect of the defence industries, the motive determining their pattern cannot be primarily economic; their organisation and capital-intensity will be dictated largely by considerations of security. Lastly, it rightly falls within the jurisdiction of the State to invest in industrial research and training—for increasing the nation's technical knowledge and capacities so that productivity may be raised.

Perhaps, as in Japan, components even of some of these capital-intensive industries can be standardised and manufactured on a small-scale. In this context it will not be amiss to recognise one advantage that small industry enjoys over big industry even in the sphere of defence and was brought to light by the Second World War. Large industry provides a sure target to aerial bombing by the enemy, resulting in dislocation and destruction of the entire economy of the nation, while small industry can be car-

ried on undetected throughout the countryside. It was this discovery which enabled China in a large measure to brave the onslaught of Japan.

Here we may also notice an apprehension sometimes voiced by the opponents of capital-intensive forms of industry, *viz.* that an exception in favour of certain types of heavy industry will prove a thin end of the wedge. It will be difficult to draw a line where one can stop and ultimately the entire industrial culture of the West will have been established. The noted historian, Arnold Toynbee says: "The truth is that every historic culture-pattern is an organic whole in which all the parts are interdependent, so that, if any part is prised out of its setting, both the isolated part and the mutilated whole behave differently from their behaviour when the pattern is intact. This is why 'one man's meat' can be 'another man's poison': and another consequence is that 'one thing leads to another'. If a splinter is flaked off from one culture and is introduced into a foreign body social, this isolated splinter will tend to draw in after it, into the foreign body in which it has lodged, the other component elements of the social system in which this splinter is at home and from which it has been forcibly and unnaturally detached. The broken pattern tends to reconstitute itself in a foreign environment into which one of its components has once found its way".[1]

But in arguing as above, three things are forgotten. First, left to himself the private entrepreneur, in the conditions of our country, mostly finds it profitable to use only labour-using techniques. The logic of economic facts is all against capital-using techniques. And, second, even if there is a fallacy in the above reasoning or, owing to other causes, he finds it profitable to establish capital-intensive forms, the State will or should simply not allow him to do so. The heavy capital goods industries that come into being, will be established in the public sector as part of a plan. Third, the splinter from the western body social may, in course of time, instead of drawing the parent body in its wake, find its level in the new environment or the latter may so adjust itself as to make the splinter an unrecognisable part of itself. That Toynbee's thesis does not represent an inviolable rule of human and social behaviour has been proved time and again by the Indian social system whose capacity of absorption and adaptation is great.

Be that as it may, barring the above industries and those, if any, which cannot be established or run on small-scale, it is not capital-intensive but labour-intensive industries that are the key to our problems.

[1] Footnote on p. 133 of the *Harijan*, dated June 25, 1955.

Capital, which is the prime need of large-scale mechanised industries, is scarce in the country and cannot be had in the required quantities even from foreign countries at the rates of interest which India can afford, while labour, which can be utilised in running small-scale industries, is lying idle and going waste. It is capital that is the limiting factor in our conditions, not labour. Communist China, too, situated similarly in regard to availability of capital and labour and to need for economic development, is now having second thoughts on her plans of establishing heavy capital-intensive undertakings that she had launched so zealously only recently.

According to a communication addressed by Prime Minister Nehru to the State Governments dated August 15, 1957, a Director of the State Planning Commission in China stated in a report recently that "modernised and mechanised construction demands heavy investment and a high technical level but only affords little employment; for a comparatively long period modernisation and mechanisation will not suit China". It was pointed out that some people were so concerned to get the most modern and completely automatic equipment that they ignored the facts of China's present economy. It was necessary to build these heavy plants and they would continue to be built. But there should not be too much concentration on them. Modern plants were characterised by high efficiency, good quality, low costs and economy in the use of labour. These could only be produced by a highly developed industry and their construction required heavy investments and much time. China is still a backward country, but rich in man-power and short of funds, and technical standards were only slowly rising. The question of foreign exchange also became important. The development of 'automation' which was taking place in Europe and America thus had no place at present in China.

This new view-point in China, therefore, advocated the construction of medium-sized and small plants even in the fields of metallurgy, coal mining and electric power. At present, it was pointed out that machines were not cheaper than man-power in China and this surplus man-power of the country was a prime factor when it came to deciding what sort of equipment to instal. Emphasis has also been laid in China on the great advantage of smaller plants inasmuch as they could be spread out throughout the country and could thus utilise local resources and give more employment and help the development of local economies.

This indicates a tendency in China, the Prime Minister went on to say, to move away from the previous approach. The first approach was of laying excessive stress on heavy industry. Then came a variation and it was stated that both heavy industry and

medium and small enterprises were necessary and there was room for both. Now the emphasis is rather more on the small industry and on employment.

Our Planning Commission also while favouring capital-intensive techniques for heavy or producer goods industries, concedes that, so far as consumer goods industries are concerned, it is in the national interest that labour-intensive techniques are used. "It is only", the Commission observes, "when we come to the production of consumer goods that the choice between techniques of production may raise difficult issues. The use of capital-intensive techniques irrespective of other considerations involves a double loss in the form of (a) displacement of labour which has in any case to be maintained, and (b) a greater draft on the scarce resources for investment, particularly foreign exchange resources. The issues involved in this field go to the roots of the problem of economic and social development.... The long-term objective of having a rising rate of investment, which cannot be sustained without an adequate level of savings out of current output, has to be accepted. It is particularly when the capacity of decentralised production to accumulate surpluses is challenged that the conflict among different desirable objectives becomes a matter of some concern. The surplus generated per person in a comparatively labour-intensive technique may be less than in a more advanced technique, but the total surplus available per unit of output for capital formation, taking into account the social and economic cost of maintaining those who would otherwise remain unemployed may, perhaps, be larger in the case of labour-intensive methods. In an under-developed economy where the distribution of doles to the unemployed is not practicable, the balance of advantage from the standpoint of equity lies decidedly in favour of labour-intensive techniques. From the point of view of development, however, the difficulty in the adoption of such techniques lies in the mobilisation of the available surplus from a large number of smaller units; but this is an organisational problem and requires to be faced".[1]

Even if handicrafts and small-scale industry are not able to produce all the wealth that we can possibly consume, they will certainly provide employment to our people and employment is any day preferable to plenty. If modern technology cannot be reached to the villagers just today, this does not mean that in the meanwhile large-scale mechanised industry in urban centres should continue to multiply and the villagers kept under-employed and unemployed. It will be suicidal and must mean certain death to millions of India's population, if the solar power stored in the 400 mil-

[1] *Second Five-year Plan*, pp. 113-114.

lions of her inhabitants is allowed to run to waste while an attempt to replace it with steam, electricity or such other power is being made. We would, therefore, do well to keep our people employed even with the *charkha*, the handloom and other hand-driven implements rather than let them eat out their hearts in unemployment. We have to realise that the measure of the removal of unemployment is the true measure of the happiness of our people.

Richard B. Gregg, author of *A Philosophy of Indian Economic Development*[1] and an exponent of Gandhian economics has expressed the need of finding employment for the vast numbers of unemployed and under-employed in India through the *charkha* in an admirable manner. He says:

> We do not usually think of the *charkha* as a machine, but it really is so. It uses the available mechanical energy of a man, woman or child for producing material goods. The handloom does likewise. That mechanical energy is derived from the food eaten by the person. The energy in the food came from the sunshine that fell on the fields where that food grew. Though in a different degree, manner and mode, the process is the same as that occurring in a steam engine or hydraulic power plant—namely, the transformation of solar energy into mechanical motion.
>
> There are today great numbers of unemployed Indians. They are, in effect, engines kept running by fuel (food), but not attached to any machines or devices for producing goods. Gandhiji proposed to hitch them to *charkha* and thus save a vast existing waste of solar energy.
>
> If we want to increase the use of mechanical power in India, this is the quickest and cheapest way. The 'engines' are all present; a man is as efficient a transformer of fuel energy into mechanical motion as a steam engine is; the spinning and weaving machinery to be used is ready at hand in large quantity and could in a very few years be increased enough to supply all needs. Any additional needs can be quickly and cheaply produced in India by artisans who need no further training in technical skill for this purpose; the speed and quantity of output possible with *charkha* and handloom are more closely adapted to the needs of the Indian villages and Indian producers than any other type of machinery; no foreign capital is needed to purchase the machinery; and, therefore, there will be no expensive interest and capital payments or difficulties arising from absentee control; the maintenance of such a factory is inexpensive and can be done entirely by available workers without further training; the amount of training needed for an operative is minimum and of a sort more easily acquired than for any other type of machinery; the 'fuel' or power cost for the man-*charkha* system will be nothing above the present food bill of the nation; the material to be used is available in every Indian State but Kerala, the smallest, at a minimum transportation cost; and the market is everywhere in India.

[1] Published by the Navjivan Publishing House, Ahmedabad, 1958, pp. 5-6.

Therefore, while the Commission's approach in regard to consumer goods industries is to be welcomed, one cannot but definitely disagree with it when it goes on to opine that, besides heavy industries in whose case considerations of size and technology cannot possibly be set aside in favour of employment, machinery should also be used or continue to be used in construction of roads, houses, railways and the like, and not human labour. If man in ancient Egypt could build the pyramids and, in medieval India, the Taj Mahal, or, if more recently, during the war years in China and Burma, he could build air-fields and roads entirely by manual labour, there is no reason why he cannot construct almost all kinds of public works without the aid of machines.

Unemployment to the extent it exists in the country and is increasing not only involves a huge economic waste, but constitutes a threat to our social and political stability. According to the Planning Commission the number of unemployed persons in the country in 1955 stood at 5.3 million—2.5 in urban areas and 2.8 in rural areas. The new entrants to the labour force during the next five years, *viz.* 1956-61, have been estimated at 10 million—3.8 million entrants into the urban labour force and the rest into the rural labour force.

The number of the under-employed is not known; presumably, it is far greater than that of the completely unemployed. For, according to a sample inquiry held by the Economics and Statistics Department of Uttar Pradesh, in 1224 rural households covering all districts of the State during the period from August 1956 to August 1957, while only 2.0 per cent of the total male labour force were completely unemployed, 20.7 per cent were found to be underemployed.

Even if the existing unemployment were to remain unchanged, some 10.0 million more jobs, at the rate at which our work force is increasing, would require to be created by the end of the Second Five-Year Plan. But the additional work, or employment opportunities outside agriculture that are likely to be created as a result of the Plan would have, according to the original estimates of the Planning Commission itself, been able to absorb only 8.0 million persons. The Commission, therefore, goes on to observe that "it would be incorrect to hold out the hope that full employment can be secured by the end of the Second Plan." (p. 112). There is no question of holding out or not holding out any hope; the revised estimates put the figure of additional jobs at 6.5 million only, thus leaving 3.5 million new entrants to the labour force of the country at the end of the Second Plan to fend for themselves. If due emphasis had been placed on development of handicrafts and small-

scale industries dispersed in the countryside and on labour-intensive techniques in all possible spheres, we would, perhaps, not have found ourselves in this sorry state.

It is clear from the table XXXII that our unemployment problem can be relieved only by small-scale decentralized industries with low capital-intensity, including cottage or handicraft industries, using lower techniques of production, and not by capital-intensive undertakings. The former provide several times larger employment than the latter. The conclusions of the table as regards employment potentialities of the different kinds of industrial units are confirmed by the Report of the Textile Enquiry Committee (September, 1954). The Report says that the organised cotton textile industry in 1953 provided direct employment to approximately 2,50,000 workers; powerloom units in the country, both large and small, which had been given texmark numbers by the Textile Commissioner, provided direct employment to 55,000 workers and the handloom industry to 15,00,000 workers (in terms of whole-time workers). 'The mill production is of the order of 4,800 million yards while the powerloom industry produces under present conditions approximately 200 million yards a year. The handloom industry is estimated to produce 1,400 million yards a year. For a production 3½ times as large, the mill industry provides direct employment approximately to one-sixth as large a number of people as are engaged in the handloom industry (assuming that 2.5 lakh workers, including assistants, are directly employed in both shifts on nearly 2 lakh looms). The employment potential in the handloom industry is, therefore, nearly twenty times what it is in the mill industry, yard for yard".

What an unrealistic dream it is to think that large-scale industrialisation will ever be able to provide a solution to our social problem as it has in the case of United Kingdom or USA, will be clear from the fact that while the number of factories in the country had risen from 8,143 in 1931 to 30,836 in 1951, *viz.* about fourfold, the number of persons employed rose only from 1.43 million to 2.54 million, *viz.* from 0.93 per cent to 1.81 per cent of the entire working force of the country. The table on the next page gives figures relating to manpower and large-scale industrial employment in the three countries stated in juxtaposition.

We should consider ourselves fortunate if large-scale industries can absorb all those who are completely unemployed today and so many of the under-employed that those who are left behind get full employment in their present occupations. But it is obvious that large-scale industries cannot possibly provide increasing employment for two million people every year, which is the natural

TABLE XXXIV

Country	Population (Year)	Total Labour Force (Year)	Percentage of employment of Labour force in industry	Labour force engaged in large-scale establishments (Year)	Yearly increase in labour force in the quinquennium 1951–56
1	2	3	4	5	6
	(In thousands)				
Great Britain ...	... 5,07,72 (1952)	2,24,82 (1951)	49	70,64* (1949)	81
U S A ...	... 15,69,81 (1952)	5,84,42 (1950)	37	1,32,590† (1947)	1,072
India ...	... 36,70,00	13,93,39	10	2,540‡ (1951)	1,886

*Establishments with more than 9 employees.

†Establishments with more than 19 employees.

‡Establishments with more than 9 employees when they are carried on with the aid of power and more than 19 employees when they are carried on without power.

Source :—Figures in columns 3 and 4 have been taken from table on pp. 150—151 of this book.

Figures in column 5 have been taken from *International Labour Review*, June, 1956, pp. 640—644.

Figures in column 6 have been worked out on the basis of percentage of labour force given in table on pp. 150—151 *ante* operating on figures of population given in the U.N.O. Statistical Year Book, 1957.

increase in the labour force of the country. The hopes of those who advocate large-scale industrialisation as a means of enabling the size of holdings to be increased by drawing the people off the land in large numbers, are doomed to disappointment. So that the basic agrarian picture will remain as it is with land-holdings as pitifully small as ever.

In view of the fact that large-scale industrialisation is not going to make any appreciable dent in our economy, any hope of reduction in the birth-rate as a consequence of urbanisation is also a forlorn hope and should not deter us from following any policy that we may otherwise adopt.

Advocates of capital-intensive types concede that in the very short run a unit of investment in a labour-intensive industry or

process will provide a greater amount of employment than a unit in capital-intensive type. But they contend, first, that although in the case of agriculture the producer in our country is also the major consumer, it is not so in the case of industry. Consumer's interest must, therefore, receive special consideration: prices of the basic necessities have to be brought down to a level at which the ordinary householder can, after meeting his basic necessities, have some surplus left which may provide him with some comforts also. The application of advanced technology and automatic methods constantly reduces the capital cost per unit of annual capacity—which is reflected in a lower cost of the product. Also, advanced technology leads to a lower cost of production in another manner, *viz.* it utilises the raw materials more fully than crude technology. For instance, a cottage worker cannot produce the same quantity of cloth from a given weight of cotton as a modern textile mill can. The wastage is so much greater at various stages of the operation. Similarly, a crude, worker cannot expect the same extraction from sugarcane as a mill. Second, that although output in labour-intensive types is greater relatively to the amount of capital used and there is economy of capital, output per man-hour or labour productivity goes down, and even though the total output would increase, it has to be shared by an increasingly larger number of workers in the industry. When this happens, the standard of living of the workers declines.

Third, that over the long period capital-intensive types will generate a greater surplus for capital formation and so make a bigger contribution to employment and national income. Capital-intensive enterprises have the effect of concentrating additional income in the hands of those who are more likely to save and invest it in further industrialisation of the country. If production is distributed into so many workers having low income, all or a large part of it is likely to be used up in consumption and little or nothing saved for capital formation, which is so essential for economic development. Fourth, in trying to substitute labour for capital in any given sphere of production, which is what the adoption of cruder or low capital-intensive techniques implies, we may actually create labour scarcity. Last, under a low capital-intensive economy we may produce goods which may not be acceptable to the consumer and may be also far in excess of demand.

There is no doubt that advanced technology leads to better utilisation of the raw materials. But, in fact, it is capital that matters most. Did we possess it in the measure we need, then, perhaps, no discussion, planning or laying down of priorities was necessary. In a country where the progress of capital accumulation

is slow and, in view of the low levels of income, is bound to be slow, and the fraction of the individual's income which is expended on the purchase of consumer goods is not large, the somewhat high price of the goods produced by the less efficient means of production is not an excessive price to pay for conservation of capital and provision and maintenance of employment. Planning for economic security—let us never forget—means, particularly, in the conditions of our country, first and foremost, planning to create and to maintain full employment. Also, in labour-intensive industries spread all over the country-side the producers themselves will constitute a large segment of the total number of consumers—far larger than what they do in economies with a capital-intensive structure where the number of worker-consumers is comparatively far smaller. So, the point about cheaper goods to the consumers being made available only through a capital-intensive economy loses much of its edge: the producers in labour-intensive industries, in most cases, are consumers also.

As regards the standard of living, capital-intensive industry will increase the standard only of those who are employed. The level of living of the masses can rise when there is full employment and this is far more ensured by labour-intensive, decentralised industry. It is conceded by critics that the total national product will be greater in an economy of low capital-intensity or cruder technology—and it is this that should matter most, not the standard of living of a limited number of individuals.

As for the third argument, *viz.* in regard to the capacity of owners and entrepreneurs of capital-intensive enterprises to save and invest: it seems to be forgotten, first, that a producer cannot sell his product unless there is enough money in the pocket of the consumer. And workers are the consumers. If most of the work force remain unemployed as they will be in a capital-intensive economy, they will have no money to buy the products and the factories will simply either not start or will have soon to close down. Second, the assumption that the whole of the excess over wages will go to capital formation, is not correct. Much of it will have to be set aside for capital replacement and a good portion is likely to escape into conspicuous consumption by the proprietorship and the management. Further, the long-run advantage of capital-intensive industry over labour-intensive industry in regard to capital formation should only be an argument in favour of special efforts to encourage and mobilise the small units of voluntary savings and of diverting income to capital formation through taxation.

The argument about labour scarcity becoming a problem, in case low capital-intensive undertakings are used, needs only to be

stated in order to be rejected. There is so much unemployment, overt and hidden, that we are all at our wit's end as to how to solve it. Labour scarcity in a country becomes a problem only when the given labour cannot produce all the goods that the country wants. When that happy situation arises, if ever it does, we can easily shift a part of our economy to labour-economising, capital-intensive techniques. As to the last argument: the past record of this country shows that the fingers of our workers can produce as fine and artistic goods as any that the machines can do. In fact, they can cater for individual tastes of individual customers with far greater ease, and possess an adaptability which cannot be matched by machines.

Further, the time factor in investment returns cannot be neglected. A part of the problem of increasing labour efficiency is to change attitudes and cause people to work harder, longer or better; and one necessary condition for this is to produce consumer goods which the people want—goods which can also be called incentive goods inasmuch as they encourage people to earn more income. But capital-intensive investments will mostly be producing capital or producer goods and thus, in the nature of things, defer production of consumer goods, and, therefore, defer the time when levels of consumption are raised. Looked at from this angle, labour-intensive forms of investment or industries of low capital intensity which ensure early returns, are preferable. They will provide consumer incentive goods earlier and thus provide an earlier capacity to create more income and saving for more capital.

As already noticed, it is contended by advocates of capital-intensive economy that it does not, of itself, predicate a society where there should be gross inequalities of income between one man and another. In this connection reference is made to the example of America which is *par excellence* a country of big industry. But the contention is not correct in its entirety. Taking up theory first: If it is an economy where free enterprise rules, an industrial undertaking will cease to function as soon as the entrepreneur's profits fall below a certain point. He has invested huge capital; if the return thereon does not come upto what he considers to be the minimum, the entrepreneur will simply close down his business. This minimum is bound to be much higher than what a worker in the undertaking, howsoever highly he may be paid, will earn as wages.

Second, while it is true that in the USA the living standards of labour are the highest of any in the world and a substantial middle class has been developed through the mechanism of differential taxation, the disparities are wide and the cartels and monopolies still flourish. Commenting on a statement of the USA ambassador

to the effect that almost a classless society had been achieved in his country, the *National Herald,* of Lucknow said in one of its editorial notes, dated September 28, 1957:

> Mr. Herbert H. Lehman, a former Governor of New York and Director of UNRAA, in an article recently in the *New Leader* of New York revealed how big business controls the American economy. He reeled off these astonishing figures:
>
> Fifty large insurance companies control 90 per cent of all the assets of all insurance companies. Of the 325,000 manufacturing companies in the country, fifty large ones make 27 per cent of the sales of all. The fifty largest firms in all fields of the national economy together effect sales of 86 million dollars, which comes to twenty-eight per cent of the gross national production of the country. In one year—1955—alone the famous firm of General Motors made a net profit of one billion dollars, or one-sixth of the total assets of the firm, on a sales turnover amounting to three per cent of the national production. 'How big is too big?' Mr. Lehman asks, looking at these figures, and answers the question by saying that when a firm attains a net sales volume equal to more than one per cent of the national production it becomes 'just too big for the health of the national economy.'

"The speed at which mergers of firms are taking place in the United States—big firms swallowing the small ones—lends emphasis to the point," says Mr. Lehman, "that if the United States wishes to retain an economic system based on competition, new rules must be written very soon to protect the ants against the giants, and the consuming public against both". He adds: "The leaders of big business and Government today pay lip service to individualism and individual enterprise. In fact, their support is being given to the new philosophy of action identified with Madison Avenue, with its emphasis on form and approach rather than content and substance".

Capital-intensive forms of industry which may, in the long run, increase income and capital formation and thus raise consumption levels more than investment in less intensive forms, will obviously tend to concentrate wealth and economic power in the hands of a few, and thus further widen the gap between incomes, particularly in a country like ours where labour is so redundant. They are likely to result in such distribution of the national dividend, that, though the average productive power and consumption per head may show an increase, large masses benefit very little, if at all. And having regard to the growing demands of the people for improved economic conditions, it is unlikely that this situation would be passively accepted for long.

If it is a socialist economy, even then the disparity between the income of the manager and that of the worker will be very large. At least, that is what the experience of the Soviet Union would tell

us. Under Lenin, the wage differences in industry were one in three. Today the wage differences in all the great factories are one in twenty.

> In his *Stalin au pouvoir* published in Paris in 1951, Orlov states that the average pay of a worker in the USSR in 1935 was 1,800 *rubles* annually, while the pay and allowances of the secretary of a rayon committee amounted to 45,000 *rubles* annually. The situation has changed since then for both workers and party functionaries, but the essence remains the same. Other authors have arrived at the same conclusions. Discrepancies between the pay of workers and party functionaries are extreme; this could not be hidden from persons visiting the USSR or other communist countries in the past few years.[1]

This approximates to the conditions in Britain where in industrial concerns there is a bottom wage of about £250 per year and a top rate for the directors and managers of about £5,000 per year. There is one important difference: in capitalist Britain there is a more severe form of income tax.

A factory is a big and complicated unit. A man who can manage it must have high intellectual and supervisory attainments and must, necessarily, be paid highly for them. Between the salary of the manager and his assistants, on the one hand, and that of the workers, on the other, there is bound to be a large disparity. Whereas in a small-scale economy the worker himself or his family is the master of the means of production: the question of gross inequalities between the income of one and another, therefore, does not arise. Or, if he employs outside labour, the extent of labour being limited by the size of the business and also, if necessary, by law, his profits cannot be unduly large.

As regards our fourth aim, *viz.* maintenance of democratic values: big owners of urban industrial property are as anti-democratic in their outlook as zamindars or junkers—big owners of rural, agricultural property. Nor will replacement of private ownership by public ownership which, in practice, is not distinguishable from state capitalism make much difference. Already in Russia there is a social and political hierarchy and a new class of managers. Big economic units, where hundreds and thousands of men work under a central unified management, militate against the growth of a truly democratic society. A manager of a state-owned factory is as prone or susceptible to the heady wine of power as the manager of any private factory. The psychology of both kinds of managers gradually gets equally corrupt and the atmosphere of both kinds of factories equally hostile to the plant of personal initiative and freedom. The ordinary worker in the USSR is, in fact, less free

[1] *The New Class* by Milovan Djilas, Thames and Hudson, London, 1957, p. 46.

and a less willing partner in the enterprise in which he earns a living than the employee of capitalist industry. The 'new' principles of industrial management in the USSR resemble a pattern that capitalism long ago discarded as old-fashioned, harsh and inefficient.

Further, the evils of bureaucracy—its slowness, waste and corruption—will multiply a hundred-fold under state capitalism. If the factory-owners of the nineteenth century, having political influence but not unlimited political power, were in a position to exploit the workers, a socialist state in the twentieth century or its agents and managers, possessing not only unlimited political power but also unlimited economic power, through ownership (that is, control) of the instruments of production, are infinitely better equipped to exploit the workers. Today, the State has to keep up some sort of impartiality between the labourer and the private mill-owner. Under a socialist system along with elimination of private capitalism and landlords, free labour movements are also eliminated and the labourer becomes a subordinate employee of the State itself—with nobody left to arbitrate between him and the employer.

The basic problem with which all those who are dissatisfied with capitalism have grappled, is how to bring economic power under social control. The simplest way of doing this, so it seemed, was to replace the private ownership of all property which represented power, by some form of common ownership. For some *viz.*, Socialists and Communists, common ownership meant state ownership. Communists differ from Socialists only in regard to the method of transfer of power. The latter believe that the change from private to public ownership must be effected by democratic methods, involving fair compensation and majority consent, while the former advocate one all-embracing revolutionary act, by which the political power of the state and the economic power of capitalists would be seized and held by a 'dictatorship of the proletariate'.[1]

But transfer of ownership from private hands to State has not realised all the hopes pinned on it. The advances towards common ownership in Britain under its post-war Labour or Socialist

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[1] The Communist Party of India has recently, *viz.* by a resolution of the Central Committee in its session held from 6th February to 11th February, 1958, which was endorsed by the party Congress in the second week of April 1958, in Amritsar, changed its creed to 'full democracy and socialism by peaceful means' and through Parliament, perhaps, as a consequence of the heart-searchings that have shaken Communism all the world over after the death of Stalin, particularly, since the Twentieth Party Congress of the USSR in March, 1956. Mao Tse Tung's speech also in 1957 which pleaded for allowing 'a thousand schools to contend' was a straw showing the direction in which the Communist mind was thinking—direction of liberalism and relaxation of authoritarian control. Still more recent events, however, indicate that the Soviet and Chinese Communists are having second thoughts and reverting to their old stand. This is likely to affect the policy of the Indian Communists also.

Government have raised doubts about the efficacy of the usual methods of political democracy in controlling publicly-owned industry. Parliament cannot effectively control—and indeed it is often argued that it should not control—the internal working of the vast industrial organisations which it has created. Even with the support of powerful trade unions in all the nationalised industries, the individual employee continues to feel that he has no real control over most of the circumstances of his working life.

Even compared to capitalism, the communist method of capture of power has made matters worse for the people. In the Soviet Union and, later, in other communist countries Marxism has been taken to its logical conclusion. "All economic power has been transferred to the State and the result is not a 'society of the free and equal'—as Marx believed—but a totalitarian tyranny. The state also commands all political power, and so is subject to no effective restraints at all. It is an even sorrier fate for the worker to be at the mercy of the state than to be the victim of private capitalists, for the state—unlike the capitalists—is ubiquitous. If capitalism is individualism run riot, then communism is collectivism run riot; the remedy is no better than the disease".[1]

It is in an economy of predominantly small units alone, small family farms and small industry or handicrafts, that democracy prospers, that there are no glaring discrepancies between the status of one man and that of another, that one man is independent of the other in the ordering of his life, that the personality of the individual blossoms forth. Only a broad distribution of private economic power can guarantee individual freedom, and this distribution of economic power is assured in an economy of decentralised enterprises of low capital intensity. Such an economy will contribute to an increase in the number and dispersal of those exercising initiative and making decisions, and thus strengthen the roots of democracy in the country.

Marcel Laloire says:

> Handicraft work has a great advantage over industrial work in that those engaged in it are fully aware of the purpose of their work. Many workers, after a number of years in the same factory, have never seen where the materials they use come from or where they go....The handicraft worker, on the other hand, begins, machines and finishes the same article himself....He chooses his own tools and his own way of doing the work. He is master of his own time and job and not only directs the work but at the same time helps to perform it, giving full scope to his imagination, initiative and abilities.
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> Moreover, the personal relationship between a handicraft worker and his assistants usually leads to a more pleasant social atmos-

[1] *Twentieth Century Socialism*, p. 124.

> phere than that found in very big firms, where the workers hardly know and, in some cases, have never been near 'the boss'. The handicraft worker belongs to the same world as his assistants. He went through the same stages as they did before setting up in business himself.[1]

One cannot, therefore, but arrive at the conclusion, that existing industry in Europe or America, either private or socialised, does not present a pattern which can exactly be borrowed by India. She will need to create its own pattern. In taking a decision on the type, scale and location of industries, we shall not be trammelled by preconceived notions or what a particular country has done in the past or is doing today. Our industries, at least, those which are established in the future, will have to meet two conditions above all: to produce things needed by the mass of the people and, using indigenous or locally produced materials in the process, to give employment to as large a number of men as possible. For this reason, industries will mostly have to be scattered widely in smaller units across the land. Such industry might be of two kinds. One may provide all-the-year employment for redundant labour and thus draw off people permanently from the land. The other might not relieve over-population in a direct way by reducing numbers on the land, but supplement agricultural labour by providing subsidiary or seasonal employment. We must not forget that it is seasonal and disguised unemployment in the country-side that is our greatest problem. Although the latter kind of industries will mostly be processing agricultural products and will, therefore, be seasonal in character, for example, sugar factories in Bihar and Uttar Pradesh, yet, in view of their low capital intensity, it will be possible to operate them economically because the loss through idle plants is small.

Land-holdings in Japan are, perhaps, the smallest in the world. Her farmers, however, have been able to improve their standard of living considerably by devoting their spare time to home industries and small industries which have been fostered by Government with almost loving care. Japan has fifty thousand factories in villages and their number is increasing constantly.[2]

Small-scale decentralised industries of low capital intensity dispersed in the country-side would be an organic growth at comparatively little cost. They will strengthen saving and investment motives, because concrete results of their frugality and investments will be there to be seen. The wealthier villagers, or groups of

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[1] Vide *Handicrafts in Europe* published in the *International Labour Review*, October 9, 1955.

[2] *Cottage Industries and Agriculture in Japan*, Chaman Lal, New Book Co. Ltd. Bombay, 1949, p. 191.

villages, might not be tempted by 10 per cent to invest in the capital market in far-off cities, even if the facilities existed to do so, but might be more disposed to establish a small private or co-operative enterprise in the village.

Similar is the experience and advice of J. B. Taylor, one of the leading organisers of war-time Chinese Industrial Co-operatives. He says: "India and China are alike in this: that the fundamental need is to improve the life of the rural people who for generations must form the majority of the population. To take away a few millions of them into industrial cities is no solution. Urban industrialisation in China, as in various European countries, has worsened rather than improved matters in the villages, by undermining the rural crafts. Small industries must be spread throughout the country-side on an organised federated basis, such as Indusco's. This not only means fostering, organising and improving cottage industries and putting electric power at their disposal where possible, but also making them a part of a system, including workshops and small factories related to them. This system must integrate with agriculture and give optimum employment to the rural communities."[1]

It is such a system that will furnish purchasing power to the masses for enlarged educational and medical services and a richer social and cultural life. To do this is to retain on a higher level something of the rationality of earlier days, when production and consumption were directly related to largely self-sufficient communities. Self-sufficiency may not be an aim today, but it would be an extravagant commercialism which saw no economy in the local provision of needs when this is possible with local raw materials and local labour for which there is no more profitable alternative.

An economy of cottage and small-scale decentralised units will avoid congestion of population and social disintegration which might result from movement or transference of rural workers to urban areas. Workers engaged in these industries in the rural area will already be living in some sort of houses, thus relieving the governments from the burden of having to construct millions of houses in a short period, and permitting funds to be diverted for meeting more urgent needs. It will also eliminate unnecessary use of transport and reduce the costs of distribution, in turn, leading to a lower cost of amenities available to the rural community. Decentralisation would, to a large extent, also obviate conflict between labour and capital. "In a country like India with vast distances and a large potential market", concedes the Second Five-Year Plan which lays

[1] *The Bombay Co-operative Quarterly*, March, 1944, Volume XXVII, pp. 259-60.

so much emphasis on heavy industry, "the demands can and ought to be met through production in efficient, decentralised units. There are other reasons also which weigh in favour of wide diffusion of industry."[1]

The Karve Committee on Village and Small-scale Industry (1955) points to some such pattern when it says that while all possible efforts should be made to provide efficient services to industrial units now located in cities, and especially to the smaller units among them, the definite policy of the Government must be not to permit the growth of a city beyond a roughly prescribed limit. The pattern of industrial activity that should gradually emerge is that of a group of villages having its natural, industrial and urban centre. These small urban centres will be similarly related to bigger ones. Thus, a pyramid of industry broadbased on a progressive rural economy will be built up. In such an organisation, small centres can experience a co-operative interest in the bigger ones and these latter would develop a genuinely supporting, instead of an exploitational relationship towards the smaller towns and the countryside.

The fact that the great cities already exist creates the tendency further to centralise industrial, commercial and service developments in them. Under the new pattern this tendency will disappear.

In view of the shortage of capital and redundance of labour in the country, therefore, we would suggest, for the pattern of our industrial development, a sequence of cottage or handicraft—small-scale—light or medium-scale—heavy or large-scale industries. Such a sequence is all the more desirable because one stage helps provide markets for the next. Cottage or handicraft industries cannot be a temporary phase, at least, for some decades to come. It is they which have the greatest potentialities of curing the epidemic of unemployment from which the country suffers today.

Here it may be pointed out that the industry which goes by the name of 'handicrafts' in the Western countries is carried on in small mechanised workshops, and is different from the 'art-crafts' or 'home-cratfs' as we understand in our country.

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[1] *Ibid.*, p. 32.

CHAPTER XVII

SMALL-SCALE INDUSTRY AND TECHNOLOGY

We must be clear about one thing in our mind: Modern life calls for the advantage of technology. While it is an essential condition of a good society that man should be free—not a slave either to another man, an organisation or a machine, it seems natural and right that the poor villager should desire the advantage of technology which will enable him to produce ten or twenty or a hundred times as much within an hour's work. This would earn him a comfortable living and some surplus time for his other interests—for fulfilling his normal and desirable purposes. These two conditions, *viz.*, freedom and leisure can be realised by bringing technology and the small machines together. Special attention will, therefore, have to be given to organising innovations or promoting technological improvements in cottage and small-scale enterprises dispersed over the countryside, so that output per head is increased even while the capital used is not large.

Slight modernisation of village crafts and rendering each village wholly or mostly self-sustaining by its own industrial effort, alone will not do ultimately. Efficient production calls for operation on a larger scale than is possible if the market is just one village. We should never forget that the industrialised world is moving fast and such halting steps would leave India lagging fifty years behind. It is an age not only of electrically-driven machines, but an age of atomic energy and automation, where machines will act without human intervention or will, and in a way, think for themselves, and produce far more at far less cost, that is, in far less time and with far less human energy expended.

In Britain and the USA they have already developed electronic thinking machines which are capable of rapidly solving exceedingly complex mathematical problems and of exercising certain types of judgment. The automatic machines contain built-in controls which enable them to adjust to changing conditions of production, correct their own mistakes, inspect the product and even replace their own worn-out parts—and thus ensure a continuous flow of production. Automation will eliminate many a tedious and hazardous task and help create goods which could not be developed by ordinary methods and which will possess a high and uniform quality never attainable when control was left to human judgment. Although automatic methods are most suitable for large companies which make great

quantities of a standardised item and their introduction involves inordinately high capital costs, machines are being perfected to bring some of the advantages of automation even to the small, short-run manufacturer. These two discoveries or developments, *viz.*, automation combined with atomic energy, will revolutionise the objective conditions in which we live to-day and will lead to much rethinking and revaluation of old habits and standards.

It would not do, therefore, to think of tools and implements at a pre-determined technological level. They must be increasingly mechanised and made more and more automatic. The invention of the *Ambar Charkha* has shown that technology can improve the little machines powered by human hands. As the Planning Commission has said, "continued efforts will have to be made to put the traditional techniques of these crafts on a more efficient basis".[1] We cannot and should not turn our back on advance in technology, while we can certainly turn it on scale or big size: that is, technology has to be divorced from size.

We can have small units spread all over the country-side covering almost all branches of industry or human activity and yet use in them—if not today then tomorrow—the latest techniques that science has placed at the disposal of man. Such units—it will bear repetition—will give us all the goods that the nation needs, provide employment to the unemployed and under-employed in their homes, ensure equitable distribution of wealth and foster the democratic way of living. Mahatma Gandhi, the torch-bearer of small, de-centralised industry, had a clear mind on this question. He once said:

> If you could have electricity in every village home I shall not mind villagers plying their implements and tools with electricity.[2]

Our problem is to retain the advantages of technological progress and at the same time to minimise its social cost in terms of unemployment. We have to reconcile the need for creation of more and more employment opportunities with the need for utilisation of modern technology. This situation poses 'a new economic problem and demands new technical methods for its solution'. Mr. D. S. Morse, Director-General of ILO, said in a report[3] to delegates to the International Labour Organisation's Asian Regional Conference in Tokyo (September, 1953):

> More specifically, the problem will be to develop a new type of industry—radically different both from the present cottage and handicraft industries and from the present large-scale factory industries —which for the same amount of capital investment, can at the same

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1 *Second Five-Year Plan*, p. 114.
2 Vide the *Harijan*, dated 22-6-1935.
3 *ILO News*, Volume VI, No. 6, September, 1953.

time produce more than the former and provide more employment than the latter.[1]

Hitherto, it is technology which has largely determined the relationship between the size of plant and efficiency. Higher technology has meant a bigger plant with greater efficiency. But, in sheer theory, science and technique are not concerned primarily with size or appearance; nor can science be confused with technology. Fortunately, as if to meet the challenge set by dense populations to economic growth, technological improvements today are tending in most industries to reduce the optimum size of the enterprise. The trend in industrialised countries towards technological improvements which make for a smaller optimum size, improvements in small internal combustion engines, and the extension of electric power or other source of power like atomic energy, may possibly facilitate innovations increasing the competitive capacity of small industries of low intensity.

Consequent on the Industrial Revolution of the eighteenth century, the scale of industrial operations had tended to become larger and larger. The only limitation was placed by competition which compelled a firm not to carry its scale of output beyond the point where neither increasing nor decreasing returns prevailed but where, instead, the rate of return was constant. Behind this long-term trend there were certain technological forces which were to be found, basically, in the use of new sources of power (steam), new types of materials (steel), new machines and processes (expensive, single-purpose machines and mechanical processes) and new forms of transportation (railroads). Each of these developments was, in itself, a powerful force towards large-scale operations, and each of them inter-acted among the others, thereby imparting a cumulative impetus towards the centralisation of production units, towards greater and greater internal economies, towards larger and larger profits to the entrepreneur.

But John M. Blair has brought forward evidence[2] suggesting that this long-term, general and pervasive increase in plant size throughout most industries has now come to an end. Taking the number of employees as an index of size, it would appear that there has been in the past thirty or forty years no spectacular increase in the size of industrial establishments. This increase has been halted

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[1] We may make it clear here that if this problem cannot be solved we will prefer, as said in the last chapter, to keep our vast man-power employed with hand-operated machines rather than have a few capital-intensive automatic machines which may produce the required quantity of goods but will render vast numbers unemployed.

[2] An article in *American Economic Review*, Vol. XXXVIII, No. 2, May, 1948, *Does Large-Scale Enterprise Result in Lower Costs?*, pp. 121-152.

by new technological developments which tend to promote a smaller rather than a larger scale of operations—which make possible a larger increase in output with only a small increase in capital or, correlatively the same amount of output with a much smaller amount of capital.

> The more important of these new techniques fall into the same categories of technological change which underlay the Industrial Revolution—power, materials, machines, and transportation—but they are qualitatively far different and their effect upon size is the reverse of the nineteenth century technology. Just as steam replaced water wheels as the prime source of industrial power, so is steam in turn being replaced by electricity; as steel replaced wood as the basic material of industry, so is it in turn being replaced by light metals, alloys, plastics, and plywood; as single-purpose, highly specialised machines replaced hand labour, so are they being replaced by newer, more flexible and adaptable multi-purpose machines and extremely efficient chemical and mechanical processes; and as railroads replaced the canal, the wagon, and the bullock-cart, so are railroads being replaced by the motor truck and the automobile.[1]

Of these technological improvements or discoveries, electric energy is by far the most far-reaching in its decentralizing effect. In the earlier stages of the Industrial Revolution, the location of industry was very largely decided by the availability of coal. The result was that the factories came to be located either near coal mines or near rail-roads and docks where cheap coal could be made available. The harnessing of electric power has revolutionized the situation in this connection. Electric power can be derived from a variety of things, not only from coal, but also from water-falls, flowing rivers, and even the tides of the sea, and can be carried over long distances. Which means that industry need no longer be located at certain specific points but can be spread out far and wide over the country-side.

There is yet another development known as the process of standardization which electrical energy fosters, and which has helped decentralize industry. Machinery makes it possible to turn out the same product or part of a product any number of times over without the slightest change in its size, shape or quality. This is as true of a small machine worked by hand by one person as of the huge monsters on which hundreds of workers attend. "The increasing use of electrical power makes it less and less necessary for industrial processes to be concentrated under one mammoth roof. Parts of the process can just as well be decentralized; it is certainly no more expensive in terms of social costs to move the finished components once a month to a central point for assembly than it is to move men

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[1] John M. Blair, *Ibid*, p. 129.

backwards and forwards every day."[1] It is possible, for instance, for the soles of shoes to be made in one workshop, for the heels to be made in another hundreds of miles away and the upper cover to be made in a third, and for these three parts to be then assembled in a fourth place—producing thousands of pairs of exactly identical and standardized shoes. It is this process of standardization which has enabled Japan to succeed in integrating small industries into the pattern of large-scale industries so well.

Writing of the factory of M/s Daihatsu Ltd. in Japan who manufacture three-wheeler trucks, Shri N. K. Biswas, Deputy Director of Industries, West Bengal, who visited it as a member of a delegation on November 26, 1956, says in his tour diary:

> Although the lay-out of their own factory is completely modernised they have not dispensed with the system of getting components from subsidiaries. M/s Daihatsu have 32 subsidiary factories working as their sub-contractors. In many of them they have participated in capital also. As automobile is a highly technical industry I enquired about the quality control of the parts supplied by their subsidiaries. I was told that with regard to the subsidiaries in which they have participated in capital they have full control as they have a voice in their management. As regards the other sub-contractors where they have not participated in capital, they assist them with all possible assistance, namely, technical know-how, the latest technological information from their development and research laboratory, and the supply of special materials, where necessary, as also credit facilities through their own bankers by issuing guarantees....They also maintain a very well-equipped Test and Research Division from which their sub-contractors draw the up-to-date technological advices and information.

The description is also true of the production methods of M/s Tossiba at Tsurumi who are the largest electrical plant manufacturers of Japan, and also of those of some other industries which in other countries are listed as 'heavy' or 'strategic' and are run on a large scale.

Switzerland can also be cited as another example, where many separate village families make wheels or other parts of watches which are assembled in the big factories and go to make the famous Swiss watches. (Great care will, however, have to be taken by the State that factory-owners in such cases do not exploit the workers who manufacture the standardized parts in their homes or small work-shops.)

As a result of these 'capital-saving' techniques, as they have been called, or 'decentralising' techniques, as they may also be called, modern technology has tended in recent years to shift towards a smaller size the point at which internal economies of scale cease

[1] *Twentieth Century Socialism* by Socialist Union, Penguin Books, 1956, p. 49.

and diminishing returns to scale begin to operate. These techniques or developments have exploded the basic assumption of manufacturing industry, *viz.*, the bigger the production units, the better and more efficient they are. It has now been established, first, that modern science and technology can be harnessed to small machines, which will not require huge capital; second, that small machines can be a commercial proposition and do not necessarily follow the big ones.

In a paper on the 'Sizes of Factories and Firms in the Cotton Industry', read before the Manchester Statistical Society on 9th November, 1949, Dr. Robson, Director of Statistics of the United Kingdom Cotton Board, points out that in the UK textile industry, whether among weaving sheds in which more than one firm operates or in the case of weaving firms, the most frequent size is under 100 looms. He states: "The main reason for this is that in weaving —in contrast to spinning—there is virtually no technical lower limit to size." He points out further that in the post-war period, between 1947 and 1949, out of 50 new weaving firms, 40 began operating with less than 20 looms each. In Japan, as against 74,000 looms spread over 116 concerns owned largely by the 'Big Ten', there are 251,000 looms belonging to the so-called 'independent weavers' spread over 5,876 units. At any rate, in the weaving section of the industry it is evident that the small unit can hold its own against the larger unit.

Atomic power which has become the basis for a new method of generating energy may well prove to have greater decentralizing effects than all of the other techniques combined. If the costs of generation in atomic power plants can compare rather favourably with the costs in coal plants or hydro-electric plants, then the other attributes of atomic energy—its mobility and infinitesimal transportation costs—should lead to its widespread utilization, particularly, in under-developed areas, thus giving a great fillip to the whole decentralization movement.

Current indications of the progress towards controlling thermonuclear reactions point to a future of limitless possibility. The most thrilling prospect is the reported possibility of converting fusion energy directly into electricity, dispensing with the heat exchangers, boilers and turbines of the conventional cycle. The mechanism for this direct generation has not yet been perfected, but experiments on a small scale have shown that it is, at least, theoretically possible.

"When that happens," said Dr. Bhabha at the Geneva Conference of 1955, "the energy problems of the world will truly have been

solved for ever, for fuel will be as plentiful as the heavy hydrogen in the ocean.'[1]

The impact of nuclear energy upon present day, rather older technology, is thus going to be no less than the impact of electric power upon the steam.

Subject to the exceptions that have already been mentioned, national interest requires that those industries alone should be allowed to be carried on, on large or factory scale, which cannot be run in small workshops or as handicrafts on small-scale. Standardized parts or components even of such industries shall, as far as possible, be produced in small units and, thereafter, assembled in a centre. Laws will have to be enacted to this effect and, if necessary, the Constitution amended. For, in a free market, benefits of decentralised, less intensive types are insufficient, as a general rule, to offset financially the superior technology of the modern mill. Left to itself, even the *Ambar Charkha* is not able to compete with the mills and is facing difficulties. Drastic situations call for drastic remedies: revolutionary visions call for out-of-the-ordinary means to realize. Big existing mills, for example, excepting those that may be producing cloth for the army and which may be owned by the State, can be easily given a notice of two years either to wind themselves up, or to sell all their product in the future to foreign countries if they can. We should produce all our cloth from the *charkha* and the handloom or power-loom. No calamity will befall us if we have to face a shortage of cloth for sometime. This step alone will give employment to several times the number of workers employed in these mills today—dispersed in their homes all over the country and masters of their time. It is needless to add that these small industries and work-shops, dispersed in the countryside, and employing, say, not more than ten persons or twenty persons (which is the limit for small-scale industries in the USA), whether electrically-operated or otherwise, should not be allowed to increase their scale and grow into 'giants'. Ultimately we should have urban villages which will take the place of rural hamlets and overcrowded cities of today, without any chimneys emitting smoke, and without any slums.

While handicraft and small-scale industries will have to be protected by the State from competition of large-scale industries, this alone will not be enough. Those engaged in handicrafts and small industries will have to combine themselves in co-operatives in order to make credit facilities available to such of them-

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[1] From an article, *Inexhaustible Power from Water—Prospects of Controlled Nuclear Fusion* by Amalendu Das Gupta, published in the *Statesman*, dated January 15, 1958, pp. 6-7.

selves as need it, to find the necessary equipment, to purchase raw materials for its members and to market their finished products. The craftsmen are often at the mercy of the middleman seller, or employer seller, who takes advantage of the former's lack of resources and ignorance of market conditions in every possible way. Provision will also have to be made to make technical know-how available to them and for research and refresher courses. In short, economies of scale and organisation can and should be secured for small units through organised co-operative working. Electricity will have to be provided to every cottage worker by the State, as in Europe and Japan. The State will, in fact, have to serve as a guiding angel in all their activities, till our artisans, long neglected, are rehabilitated and put on their feet. With this reorientation in our policy, they will, in no time, recover their old skill which was once the wonder of the world, and which will furnish purchasing power to the masses and thus help start a kind of beneficent chain reaction that will result in higher levels of living all around.

To look back and summarise: With certain exceptions, we have to lay emphasis on handicrafts and small-scale decentralised industries of low capital intensity which will form the main pattern of our industrial economy. It is from small-scale industries that we will progress, as and when real incomes rise, to light and medium industries and thence to heavy industries, to the extent that the economy of the country as a whole can bear. The techniques of the handicrafts and small-scale industries will have to be continually improved. If there are no improvements or innovations, *i.e.*, if we do not avail of what science and technology have placed or will place at the disposal of man, we will keep our economy backward and will not reap as much advantage out of our physical resources as we can.

The question, however, arises what these innovations are and what, apart from political factors, in the past, has stood in the way of these innovations.

CHAPTER XVIII

ATTITUDES AND INNOVATIONS

We have seen that our material resources are not abundant relatively to the size of our population and, contrary to popular belief, our industrial potential appears to be far lower than that of the USA, USSR and several other countries. But whatever the amount of our natural resources may be, economic development of the country to the limit that this amount permits, depends on our power to convert these resources into consumer goods and services and into instruments of production—on our power to convert the potential into the actual. For this, we require capital and the necessary skill or knowledge. But, as already noticed, owing to existing low consumption levels of our people, adoption of a democratic system of Government and other reasons, the rate of capital formation within the country is bound to be low. Also we cannot, for whatsoever reasons, obtain capital from external sources in the quantities that we need. For shortage of capital and a huge population, our industrial development is bound not only to be slow but to be patterned differently from the West.

The technical knowledge which a country possesses and the technical or technological improvements that it is able to effect in consequence, are the second big factor in the speed and scope of its economic development. These innovations or improvements will help to convert the potential resources into the actual, and also improve the quality and efficiency of labour and capital. But what are innovations?

According to Horace Belshaw, innovations cover all aspects of life, material as well as non-material. Economic or technological innovations are changes affecting human behaviour especially related to economic processes or arts directly applied to the production of goods and services. For example, deciding to save more, or to transplant paddy instead of broadcasting the seed is an innovation. Better machines which raise productive power per head are but results of human behaviour embodied in concrete things and are innovations. Change in religious beliefs is primarily motivated by other than material or economic ends, yet has economic results.

Joseph A. Schumpeter, in his book, *The Theory of Economic Development*, (George Allen & Unwin, 1951), assigns the key-role in economic development to innovations. He lists five types of innovations (p. 66): (i) conquest or discovery of a new source of supply

of raw materials; (ii) carrying out of a new organisation of industry; (iii) introduction of a new method of production; (iv) introduction of a new good, or a new quality of a good; and (v) the opening of a new market. Horace Belshaw would also include in the concept any change affecting the efficiency of labour, capital or organisation other than the one resulting from a change in the ratio of population to capital and natural resources, or economies of scale.[1]

The case of North America would serve to illustrate the role of innovations in the economic development of a country. There was no dearth of physical resources in the territory now known as the USA and Canada before the Europeans arrived to colonise it. The few inhabitants or 'human resources' that were there, were sunk in depths of poverty because they lacked the will and knowledge to improve their economic conditions. The farming and non-farming arts, if there were any at all of the latter kind, had ceased to improve. There was no continued technological progress. The territory, rather the entire continent had reached a state which might be described as 'technological stagnation'. When this state is reached, particularly, in countries where levels of consumption are close to the subsistence level, any increase in national income has a tendency to be absorbed, first, in an increase in consumption levels and, second, in an increase in population. The result is that there are no savings and no capital formation. Thus there is no economic progress. It is in such conditions that technological innovations play their greatest role as a generating force which will start a sort of a nuclear chain reaction and achieve a break-through.

Innovations are important in another sense. Many of them require capital for their expression: for example, a technical improvement may require a new machine for its utilization, which means more capital. To the extent increased capital is congealed in technological innovations, it is saved from being frittered away in objects that do not lead to economic development of a country. In our conditions, therefore, where an increase in the rate of capital formation is difficult to bring about and the rate of population growth is likely to increase, while the need for more capital has to be stressed special importance must be attached to promoting innovations in order to prevent the effects of any initial increase in capital formation being absorbed by population increase.

Horace Belshaw says:

> Three or four centuries ago the civilizations of India and China were more closely comparable with those in the West in economic forms and achievement than they are today. The capacity to create capital was probably no less than in the Occident; but the urge to

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[1] *Population Growth and Levels of Consumption*, Footnote pp. 4-5.

> seek material advancement and ability to promote changes to that end proved much weaker. Had the advantage of the West been merely an early superiority in capital accumulation rather than in the ability to develop significant innovations such as the use of steam power, the joint stock company, or an efficient civil service, the process of improvement in levels of consumption would have slowed down. The progressive widening of the gap in wealth and levels of consumption are primarily attributable to the greater propensity to innovate in the West. In particular they are due to the emergence of the social phenomenon of planned innovations; more recently, to organized research as a part of the planning, and, at a rather late stage, to innovation in the form of family limitation. These made it possible to increase investment faster than population increase.[1]

Peasant communities in Asia suffer from a fatalism which may be due as much to existing poverty and consequent inability to provide against natural hazards, including disease, and to illiteracy, as to religious beliefs and customs.

Poverty stands in the way of adoption of new methods or innovations, because the latter usually involves some additional outlay and also risks. The western farmer or manufacturer is more disposed to try new methods and lines of production because he has the financial means to make the necessary investment and to bear possible losses. The income of a peasant or a handicraft-man in India and other eastern countries, on the other hand, is so small that he cannot purchase, for example, a better plough if one has been discovered or a small power-driven loom, if he wishes to. Also, losses may mean all the difference between existence and starvation or involve him in debt from which recovery is very difficult. This difference in incomes makes all the difference in their approach to economic problems.

Among the conditions associated with poverty may be mentioned high death rates, and disease and insufficient nutrition. High death-rates in under-developed countries, especially among juveniles, lead to great economic and social wastage. Nearly half of the newly-born population in our country, *viz.*, 46 per cent die before they reach the age of 15, *i.e.*, before they can make any contribution to national income and only 15 per cent reach the age of 60. The corresponding figures for New Zealand of those who die before the age of 15 and who survive till the age of 60 stand at 6 and 73 per cent respectively; those for England and Wales at 12 and 64 per cent.

The table on the next page highlights the problem of our high death-rate in comparison with several other countries from another angle. It is not only at birth that expectation of life is lower in our country—it applies to each age-group. Having reached the age of

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[1] Horace Belshaw, *ibid*, pp. 152-153.

TABLE XXXV

Expectation of Life of Males at Various Ages

Country	Period	Age 0	5	10	15	25	45	65
Netherlands	1947—49	69.4	67.4	62.7	57.9	48.5	30.0	13.9
Sweden	...1941—45	67.06	95.07	60.45	55.74	46.98	29.25	13.68
England and Wales	...1948	66.39	64.49	59.76	54.94	45.66	27.42	12.75
Australia	...1946—48	66.07	63.77	59.04	54.28	45.04	26.83	12.25
Denmark	...1941—45	65.62	65.16	60.46	55.71	46.68	28.76	13.20
New Zealand	1934—38	65.46	68.70	59.11	54.42	45.43	27.78	12.76
Canada	...1947	65.18	64.43	59.79	55.07	45.95	28.03	13.25
Switzerland	...1939—44	62.68	61.64	57.08	52.41	43.62	26.15	11.60
U S A	...1939—41	61.60	60.76	56.12	51.43	42.51	25.52	12.07
Germany	...1932—34	59.86	61.70	57.28	52.62	43.83	26.61	11.87
Ireland	...1940—42	59.01	60.68	56.25	51.60	43.10	26.47	12.31
France	...1933—38	55.94	57.06	52.57	47.94	39.59	23.99	11.05
Finland	...1941—45	54.62	55.41	51.27	46.87	39.23	23.76	11.11
Austria	...1930—33	54.5	58.3	54.1	49.5	41.0	24.7	11.2
Italy	...1930—32	53.76	59.68	55.46	50.98	42.69	26.37	11.92
Japan	...1947	50.06	53.61	49.49	44.93	37.60	23.12	10.16
USSR (in Europe)	1926—27	41.93	54.72	51.65	47.34	39.46	24.41	12.07
Egypt	...1936—38	35.65	49.75	46.86	43.53	36.35	22.71	10.47
India**	...1941—50	32.45	40.86	38.97	36.24	29.78	17.63	8.18

*U N O Demographic Year Book, 1951, pp. 526-39.

**UNO Demographic Year Book, 1955, p. 742.

entry into production the Indian worker contributes to production for a shorter period. The ratio of working to total life in India is less, very much less.

Our high death rate is inescapably associated with a high rate of morbidity. For one man who succumbs to a disease in a year there must be five to ten who suffer from it, so that the prevalence of sickness may easily be five to ten times as large as the incidence of mortality. Disease, ill-health and under-nourishment thus result in reducing the amount of working time. Further, inadequate nutrition and disease sap energy and induce lethargy and low receptivity to new ideas. Improved health will not only reduce the amount of lost time but also increase efficiency per man-hour and, therefore, promote an increase in output per head of total population. Healthy people are also more receptive to new ideas and inclined to make changes.

Then comes illiteracy. We lack in an adequate supply of skilled workers and technically trained persons. We will have, therefore, to find resources to undertake research and train people. For, it is then alone that they can be persuaded to make changes. Without a system of education related to the life and needs of society, and providing a ladder from the primary school to the University, continued economic progress is unlikely. Research or testing has to be followed by professional training which has, in turn, to be followed by advisory services or extension activities in the field.

It is the improvement of their skills and capacities which increases the productive potentialities of human beings. During the period from 1929 to 1953, total national real income in the USA has a little more than doubled, although resources in terms of total man-hours in the labour-force increased only by 17 per cent, and in terms of total capital stock only by 42 per cent. The only explanation for this increase in income at a rate faster than capital and man-hours worked, lies in the improvement in the human factor—a result of increased training, education, and additional capabilities based on health and new knowledge. The USA has invested in the education of her people on a mass scale right from elementary schools to graduate schools and technical institutions—on a scale larger than Britain and many other countries.

In Japan six-year compulsory universal education dates back to 1873. This provided a literate population in rural areas, more skilled in farming, and a supply of labour available to industry "more sophisticated than European countries at the time."

According to Selig S. Harrison,[1] there are three countries in Africa that are investing more *per capita* in human resources in this

[1] Peter Drucker quoted in *Which Way Lies Hope?*, 1957, p. 196.

generation than India is doing. It implies that we have to spend more on the improvement of the human material, which has been greatly neglected hitherto, even if we are forced to cut down a number of big plants and projects. "Primary schools", says Dr. Bert Hoselitz, Director of the Research Centre in Economic Development and Cultural Change at the University of Chicago, "may be more decisive for India's economic development than steel plants."

Prime Minister Nehru has been rightly laying stress on the need of more and more scientists and trained personnel for economic development of the country. It is true that physical resources of the country can not be developed without scientists, engineers and other technical personnel but it does not follow that mere availability of technical personnel will automatically lead to economic development of the country. The Indian economy, in absence of other conditions mentioned in this book, is not expanding at the rate at which technical personnel in the country is forthcoming. Indian doctors, engineers and scientists, therefore unable to find employment in their mother country, are going to the U.S.A., U.K. and other countries for employment. A report in the *Hindustan Times*, New Delhi, dated July 13, 1959, reads as follows:—

> NEW DELHI, Sunday.—Of the 578 scientists, engineers and other technical personnel who returned from abroad recently, nearly 256—44 per cent—are without jobs.
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> Till April this year, 2,800 Indian scientific personnel now abroad had got themselves registered in the National Register.
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> * * *
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> Investigations also show that only a small percentage of scientific personnel—trained in India or abroad—are employed in industry. The Government is their major employer. Forty-one per cent of scientists are employed by universities and other academic bodies, 52 per cent by the Government and only 7 per cent by private industry. Seventy-one per cent of the engineers and 52 per cent of technologists are employed by the Government as against 18 and 34 per cent respectively by industry.
>
> As against this, nearly three-fourths of a million scientists and engineers are employed by American industry.

For a society like that of modern India, however, more important than removal of any of the above handicaps, it is necessary to change its motivation-pattern first—to change its attitude to life. The speed of our economic development will be governed by the basic motive springs of our people—by whether people want material advancement and want it sufficiently to work and labour for it—whether they are prepared to apply science and technology for the purpose. Once our mental attitudes are changed, half the battle for economic development of the country would have been won. Economic development "is not exclusively—may be not even primarily—an econo-

mic process; it also involves a deep cultural and social change—a change in values, habits, knowledge, attitudes, ways of life, social ideals and aspirations."[1]

Criticising what he called 'the Myth of Heavy Industry—the Adoration of the Iron Calf' in his book, *India: The Awakening Giant*, two years ago, an American economist, W. S. Woylinsky, exclaimed that "if it were possible to transplant overnight all the factories of Michigan, Ohio and Pennsylvania to India without changing the economic attitudes of her people, two decades later the country would be about as poor as it is now".

It is religious beliefs which play an important part in determining the behaviour of a people. The Hindu religion, as interpreted by certain schools, places great reliance on asceticism of an individualistic and functionless kind and gives an extreme rationalisation for and by ignoring the material world. In fact, there should be no necessary conflict between wealth and piety and, as Kingsley Davis has pointed out, it would be helpful to economic development if a man could feel both wealthy and pious. But Hinduism has generally laid great stress on other-worldliness, or, at the most, gives little positive inducement to hard work and the accumulation of wealth.

Change of the present motivation-pattern of our countrymen, cannot be left to a few private entrepreneurs here and there. As it should be, Government is doing its part in bringing about the change through the Five-Year Plans, Community Development Projects, etc. But this change is not easy to achieve. A vast educational effort is needed, and it may take even two or three generations to give results. Perhaps, with this end in view, it would be advisable for Government to take leaders from all walks of life into confidence, and think out a detailed programme in which there will be scope both for official and non-official effort and initiative. The change of a particular motivation-pattern, it may be pointed out, does not necessarily mean the abandonment of all old values, art, literature, etc., and still less of dress and food habits. It merely means a change in the outlook of the mind and, thus, of endeavour.

The caste system is another impediment to economic progress. The conception of a hereditary occupation is exactly the opposite of the idea of free opportunity, open competition, and individual mobility associated with a dynamic industrial economy. The fact that India had a much more developed caste system than of Japan, helps to explain why, *inter alia*, Japan could industrialise more rapidly.

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[1] A letter entitled *What is the Key of Economic Growth?*, published in the *Hindustan Times*, New Delhi, June 23, 1959.

Another feature of Indian social organisation distinguishing it from 16th century Europe and militating against industrialisation is the joint family system. Such a system, like caste, with all the countervailing advantages that it might possess or might have possessed, limits social mobility and social change because it binds an individual to others on the basis of birth and forces him to contribute to the support of a larger group independent of their ability.

Added to these drags, there is the question of regionalism associated with language that has come to the fore since independence. It bedevils progress of the country as one economic unit and diverts much energy and emotion that could otherwise be harnessed to useful purpose.

Western countries were particularly free from these barriers to economic progress. These barriers or factors are becoming attenuated in India also. They will, in course of time, doubtless change in form until they have either disappeared or accommodated themselves to modern technology and modern economic life. But that they are still present today and are interfering with economic progress, cannot be gainsaid.

CHAPTER XIX

PROSPECTS FROM INDUSTRIALISATION

India will eventually achieve a far greater measure of industrialisation than today, but here should be sounded a note of warning. It will be a mistake to over-stress industrialisation on the basis of Western experience. There are certain broad facts which stand out, and should always be kept in view while discussing economic development of the country. They have, in fact, been already mentioned or hinted at, but will bear repetition.

Our huge population relative to land resources, *i.e.* our low land-man ratio is a deterrent to industrialisation. Because more men under given conditions will produce a greater amount of food from the same area than fewer men, and men must have food above all, they will continue to stick to land rather than move to factories. People leave agriculture and take to manufacturing when food is not only available for all, but is cheaper than manufactured goods, that is, when for the same amount of skill and energy expended, there is a greater return in manufacturing than in agriculture. So, in a crowded land the scantiness of food—which results from diminishing returns in agriculture—tends to prevent manufacturing. In a new area with abundance of food supplies it is the other way round: diminishing returns in agriculture stimulate manufacturing—because of diminishing incentives for agricultural production owing to its cheapness.

Supposing that the cultivable area of a country produces or is able to produce food only in the quantity which suffices for its population, if an overwhelming percentage, say, 90 per cent are engaged in agriculture, they will have very little to sell. Most of the food will have to be kept back for personal consumption. With little or no food available in the market, nobody will take the risk of giving up agriculture for the sake of taking to manufacturing. And with little or no surplus food to sell and, therefore, with little or no purchasing power at its disposal, the peasantry which will be constituting 90 per cent of the people, will not have the wherewithal to buy the non-agricultural goods even if any at all are manufactured in the country. So a dense agrarian economy finds itself in a vicious circle. Density of population on land can be decreased (and the standard of living raised) only if a good proportion of the people take to manufacturing. But they cannot take to manufacturing because of the fact of this very density. No programme of industria-

lisation in a densely-populated country like India can, therefore, be sufficiently far-reaching unless this circle is broken—unless the programme involves, rather is preceded by a revolution in agricultural production—a technological revolution which will ensure far greater production per acre than to-day. As we shall see in the succeeding chapter, this circle can be broken.

The second fact that has to be borne in mind is that, in the conditions of our country, even when industrialisation has been achieved at the optimum, we will not be able to attain the material standards of the USA or Canada.

Man must have food above all, and, as such, food is the greatest need of densely-populated countries like India and China. Factory production does not increase the amount of food and is, therefore, no cure for the misery that stems from food shortages. Not only there is no improvement in the food situation from the industrialisation: if we look back at the table II entitled 'Production on Chinese Farms' on page 30 it would appear that reduction of people working the soil above 'B', possibly even above 'C' (and their transference to non-agricultural occupations) would reduce the total food production of the country.

Apparently, under existing conditions, there are two ways out of the difficulty. First, we may draw or transfer to the factories people corresponding only to groups 'D' and 'E' in the Chinese table, that is, people from those regions where the pressure of population against the existing soil is so great that the stage of a static yield per acre has been reached, in which case there is likely to be no change in total food production from the transference. With this labour there may be some advantage in manufacturing for export, since it would add no food to the total, if employed on the farms. This labour need to be paid very cheaply. We cannot, therefore, be worsted or outbid in a world where in most countries labour is dearer, provided *laissez-faire* or free competition prevails. But free trade or competition is no longer in vogue anywhere today. Almost all countries are resistant to manufactured goods from outside as far as they can help it and, if they find it necessary, will erect tariff barriers. Also, the demand for higher wages even on the part of this labour, which, though superfluous for the land, can under our existing laws easily organise itself, will have to be reckoned with. As regards the internal market, inasmuch as the vast mass of the people who remain on the farms will be living not much above subsistence level, they will not constitute a very active market for the manufactured goods, except in bumper crop years. The limited industrialization that we will be able to achieve in this case, will thus result neither in eradication of unemployment or under-employ-

ment that exists in our villages today nor in increased *per capita* income of the country.

Second, we may draw upon people not only corresponding to groups 'D' and 'E' but also those corresponding to group 'C' and, in exchange of our industrial products, buy the necessary food from foreign countries to meet the needs of our growing population. It is this course which some countries of Europe, notably the United Kingdom, adopted when they developed their economy. It is true, in this case, that is, if a large enough part of the rural population shifts to the cities which permits larger *per capita* income for the remaining farmers, there will be an active internal market to absorb the manufactured goods. But the snag lies in whether the possibility of our obtaining food or continuing to obtain it in future also from outside will materialize.

Great Britain developed in this way during the last century. But she was fortunate because she was first in the field and developed her industries and foreign trade at a time when the productivity of cultivation in the world as a whole was developing at a faster rate than the population of the world as a whole. A whole New World was being opened up by modern transportation. Virgin land with fertile soil was plentiful and yielded an abundant return in relation to the effort and expense involved in bringing it under cultivation. Also, the industrial trend in Great Britain and in the West generally had set in before the rural population had increased excessively, and since then any surplus had been continuously drawn away to the towns, or to countries beyond the seas by migration. The number of emigrants from Europe to the new continents from 1815 to 1914, has been estimated at more than sixty million, twenty million of whom came fom the British Isles alone.

World conditions, however, are fast changing. Now there are no more vacant fertile lands to exploit, and soon there will be no surplus food in outside countries available for export, and little or no demand for industrial goods that India may produce. Richard B. Gregg, an admirer of Mahatma Gandhi's economics and programmes, says in his book, *Which Way Lies Hope?* (First Edition, Navjivan Press, Ahmedabad, June, 1952)—

> Industrial nations make machines, tools, conveniences and luxuries and sell them to other nations in exchange for food cereals, meat and fruits. England began this policy; Europe and America followed. Japan later did likewise. Having done so, the population in all those countries rapidly and greatly increased. They became very prosperous. But the prosperity was only as reliable as the outside food supply and the amount of food produced in other countries was and still is out of the control of the food-importing countries. As long as there was surplus food anywhere in the world,—

Canada, USA, the Argentina, Australia, Siam, Burma etc.—it could be drawn into the more advanced industrialised countries. The people with surplus food were glad to sell it in order to get the products of the machines in places like Great Britain and Europe.

But now there is a new situation in the world. Population has increased mightily not only in Britain and Europe but in every land. And the amount of land capable of producing food has increased very little....The result is that food-producing areas are exporting less and less....

This puts Great Britain and Western Europe into the same dilemma that India faces: too many mouths for the local land to feed. Right now, if it were not for the United States money and food subsidies, Western Europe, Great Britain and Japan would be suffering severe famines and millions of deaths from them. Japan is now receiving over a million dollars a day in subsidies from the United States. With the best will in the world, the United States cannot continue this long, for her own soil is eroding and her own population steadily increasing. Between 1900 and 1950 her population has doubled, from 76 million to over 150 million.

For these reasons the past successes of industrialism are not a valid argument for further industrialisation of India. She cannot import endless food from abroad as did Britain and Europe in their heyday. By the export of manufactured goods, India will soon thereby be able to buy very little food from the outside, for that outside exportable food supply is steadily and inevitably shrinking. And the export of hides and bones of her cattle, in payment for outside food, only robs her soil of calcium and phosphorous, and lowers the fertility of her soil and hence her own food production. Export of minerals and fibres would help a little, of course. But jute products are the only fibres which would not meet severe competition from outside (pp. 50-52).

We may add that our monopoly in jute is no longer secure. We have a competitor in Pakistan, and South American countries are making experiments in growing jute in which, looking to their climatic conditions, they may well succeed. Also, attempts are being made in some countries to find a synthetic substitute for jute. Further, our monopoly in tea which we share with Ceylon is now being threatened by China.

India must, therefore, produce her own food and for this, because of its low land-man ratio, she will have to put or retain a far greater proportion on the soil than most other countries. If instead of doing this, she adopts the policy of forcing the exports of industrial products and relies on the purchasing power thus acquired in order to back steadily increasing demands for food, she would only succeed in injuring herself. Any product sold by as large and populous a country as India in the world market in sufficient quantity to help her economy measurably will represent a

substantial portion of the world trade in that commodity. It will, therefore, affect seriously the other major countries exporting the same or similar products, and they may be expected to protect themselves by various measures, including possible price reductions. The price of food required by India will, therefore, go up and that of manufactured products will go down so that increasing quantities of industrial products will have to be sold by us in order to procure the same amount of food.

The 1951 Census Report of India states:

> This does not mean that development of industry is unnecessary or unimportant. Far from it. But we should be clear about why we need it. We need it, in order to provide ourselves with those goods and services which add to the comforts and conveniences of life and to make life and work less laborious. Industrialisation will not help to solve our food problem, except indirectly to a limited extent in so far as it can provide the materials needed for the development of agricultural productivity.[1]

What it means is only that industrialisation is not the answer to the food problem; the widespread belief to the contrary is a fallacy based on a misreading of history. Also, that industrialisation, in order to sustain itself, must be based overwhelmingly on the internal market: hundreds of millions of potential consumers in the country must be converted into effective purchasers. This means that real income per head must rise if industrialisation has to be achieved.

How the growth of real income per head leads to industrialisation (and, therefore, is associated with the rise of secondary and tertiary, and fall of primary employments) can be explained thus: At low levels of income, the demand for food is intense and that for manufactures and personal services is relatively low. But as incomes increase, the relative importance of manufactured goods and personal services increases. There is a limit to the consumption of foodstuffs, while no such limit can be placed on consumption of manufactured goods and services. The income elasticity of demand for most of the staple food-stuffs is, therefore, low and that for manufactured goods and services high. Thus, as real incomes increase further, a point will come when the demand for these goods and services will rise faster than for food. But services being non-transportable, they must inevitably be found or provided by the workers within the country and it is also advantageous to produce the manufactured goods within the country rather than import them. The income elasticity of demand for manufactured goods and service is a measure of the additional amount a country would spend on them. The rate and extent of increase in real incomes, therefore,

[1] Volume I, Part 1-A, p. 210.

becomes the governing factor in the shifting of population from primary to secondary and tertiary occupations. Increased real income per head is, thus, not only a consequence, but also a cause of industrialisation.

In India the real income or output per head is low. So there is greater resistance to reducing food consumption than consumption of manufactured goods or services, and the income elasticity of demand for the latter is low. The reason for low incomes is that the overwhelming majority of Indian people depend on agriculture, and agricultural production per man is low. According to the census of 1951, 68.3 per cent of the people are engaged directly in agricultural production and only 10.6 per cent in production other than agricultural. The remaining 21.1 per cent are engaged in commerce, transport and other services. Granting that, of these tertiary services, industrial or non-agricultural production claims three times its share, *viz.*, 8.5 per cent, we are left with 12.6 per cent who may be taken to render some service or other to the cultivator and, therefore, to depend directly on income derived from agriculture. Thus, it is agricultural production that determines or provides the real income of $(68.3 + 12.6 =)$ 80.9 per cent of the people.

While increase in agricultural production will furnish purchasing power to the masses with which to buy the manufactured goods and the services, it will also, as pointed out in the beginning of the chapter, release workers from agriculture for transference to industrial and tertiary employments. At the present level of efficiency of our agriculture, however, release of manpower from it is not easy.

> Investigation of the productivity per head of the primary industries of different countries shows that on the basis of each country's average output per head in the primary industries, New Zealand would occupy only 6.4 per cent of her labour force for supplying its entire population with a scientifically arrived at optimum diet, Australia would occupy 9.7 per cent of her labour force and that in Japan, Russia, India and China the attainment of the optimum at the present per capita output would require more than their entire labour force in each case. That these countries have an industrial population shows that food consumption is below the optimum, while the excess in the more prosperous countries shows consumption above the optimum or export of the surplus. It is the release of man-power from agriculture which goes with the growth of secondary and tertiary employments with higher per capita output.[1]

People anywhere in the world will engage in industry, commerce, transport and other non-agricultural occupations only if they

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[1] An article by Dr. P. S. Loknathan entitled *Occupational Planning* published in the *Eastern Economist*, dated July, 1943, p. 265.

have an assured supply of food—the prime necessity of man—whether from local sources or from outside. Food will be obtainable locally only if the farmers produce surplus to their needs or the needs are depressed and the people go underfed. In the latter case, efficiency of labour will suffer and there will be little purchasing-power in the pockets of the farmers with the result that economic development will not proceed far. Food will be obtainable from outside either if along with raw materials particular skills are also available locally so that it is more economical to import food in exchange of manufactured goods than in exchange of raw materials, or if an outside source or sources of food are under political control of the manufacturing country so that the economics of food production and supply are irrelevant.

Not only that there can be no industrialisation unless food or farm surpluses are available (within the country or their supply, of course, in exchange of manufactures is assured from outside): the speed and scope or pattern of industrialisation will depend on the rate and amount of the surpluses which can be realised. Farm surpluses in a country where labour is still relatively abundant and capital scarce, that is, men are cheaper than machines, call for an economy in which hand-operated industries or handicrafts and cottage industries will predominate. When farm incomes increase still further and a cumulative process has been set afoot, that is, the industrialisation that has already been effected itself becomes a cause rather than merely remain a consequence of increase in incomes, so that a point is reached where labour is relatively scarce and capital abundant, that is, men cease to be cheaper but become dearer than machines, the economy will develop into one where machine-operated or mechanised industries will predominate. Hence the progression from handicrafts to mechanised industries—from labour-intensive techniques to capital-intensive techniques—will obviously be governed by the rate at which capital becomes available relatively to labour that is released from (or not required in) agriculture.

Economic development or transference of population from agricultural to non-agricultural occupations, therefore, in countries like India which are under-developed today and cannot or do not want to exploit lands and labour of other peoples, will ultimately be governed by the extent of agricultural surpluses that they can achieve internally (and the mineral wealth they possess and can exploit).

In a speech delivered in a meeting of the Association of Manufacturers in April 1957, Prime Minister Nehru said that one of his colleagues had recently made a quick survey of the small-scale industries that had been started in Punjab since independence and

was very much impressed with what had been done both by the permanent residents there and those who had come from Pakistan as refugees. "I believe he listed 26,000 small enterprises that had grown up in the last few years in Punjab with a relatively small capital but with a great deal of energy and enterprise. That is the kind of thing which heartens one and increases one's self-confidence".[1]

These enterprises in Punjab have come into existence only because the tiller there produces food (and other materials) surplus to his needs. This is in no small measure due to the fact that inhabitants of Punjab, particularly, displaced persons from West Pakistan are imbued with an urge to seek material advancement and, therefore, have a greater propensity to innovate. If farming practices in any region do not improve and/or more capital is not invested in land, and the farmers do not produce food surplus to their requirements, then, with increasing population, more and more men will take to agriculture (and industries will decline) as, for example, in Uttar Pradesh and some other parts of India, because more men on a given area produce a greater total. If these practices continue to improve or more capital is invested, or both, the trend, as illustrated recently by the example of Punjab, will be in the reverse direction, that is, more and more men will take to non-agricultural occupations.

Economic development or retrogression is a cumulative process: once an area has started to expand, it tends to expand cumulatively; and once it has started to decline, it tends to decline cumulatively. To elaborate even at the risk of repetition: if in a country supply of food is assured to the entire population and, over a period of time, prices of food and other agricultural goods continue to fall or remain lower in relation to those of non-agricultural goods, then people will increasingly take to secondary and tertiary employments—originally to such employments among these as do not require a greater degree of skill and amount of physical labour than agricultural production. As a consequence, land-holdings of those who are left behind in agriculture will become larger and larger, yielding greater and greater surpluses to the farmers and, thus, putting more and more purchasing power at their disposal. This purchasing power, in turn, will lead to an increase in demand for more and more non-agricultural goods with the result that more and more people will be required to produce, transport and distribute these goods and, as the prices of agricultural goods will be comparatively lower, these additional people will be provided by or released from agriculture. It is thus that the process of economic development goes on: growth

[1] Vide the *Hindustan Times*, New Delhi, dated April 14, 1957.

of secondary and tertiary employments becomes a cause rather than remain merely a consequence of increased incomes in the primary sector. A country will go on developing economically to the extent supply of food allows it—till the stage when parity between agricultural and non-agricultural incomes has been reached as in the UK, that is, when it is no longer profitable for farmers to leave their profession.

As for economic retrogression: today the UK, which offers an example of perfect economic development, has to obtain her food supplies partly from foreign countries. She is able to do so because she has the advantage of possessing specialised skills and specialised industrial equipment as compared with many a country which are not equally developed but can give her food in exchange of industrial goods. But when other countries, too, would have, in course of time, become industrialised so that they need no longer supply food to the UK in exchange of industrial goods and, investment of more capital and application of advanced technologies notwithstanding, she is unable to increase her agricultural production with the present strength of workers on the soil then, provided migration to take off the increasing population is not possible, she will have to release people from the secondary and tertiary sectors in order to work on land for, as we have seen, under given conditions more people produce a greater total from a given area than fewer people. She would then have entered upon a period of economic retrogression resulting in a gradual decrease in the area of landholdings and the demand for industrial goods. Factories will close down, commerce will decline, and transport will cease to operate, the released workers being thrown back on land. This cumulative process of retrogression, where low incomes in one sector are both the cause and effect of low incomes in other sectors, could be arrested only when agricultural production per acre again begins to increase at a greater rate than the rate of population growth.

Large parts of India find themselves caught in this process of economic retrogression since the day the Britishers came to the country two centuries ago. This Gordian knot has to be cut if India has to be saved in the economic sense, and it can be cut only if determined attempts at increasing agricultural production per acre are made. There is simply no other way.

As regards prospects of material prosperity from industrialisation, the case of Japan is in point. Her industrialisation was facilitated, in the first place, by the fact that, as already pointed out, she became a colonial power and was able to bolster up her economic life by exploitation of other peoples and their resources. Secondly,

but in no case less important, the productivity of Japanese agriculture has always been high—higher than that of India. But even though Japan industrialised despite her *initial* high density, *viz.*, that of 1500 per square mile of arable land, the initial population plus the subsequent population growth (which brought the number to 4250 by 1953) caused the standard of living to rise much more slowly than it would have otherwise done. We will ask the reader to look back at table no. XXIV on pp. 141-142 and find the place which Japan occupies. *Per capita* national product of Japan in 1952-54, with 55 per cent people engaged in the industry (22) and service (33) sectors, came to 190 dollars only, while that of the Union of South Africa, Brazil and Mexico, with only 51, 39 and 39 per cent engaged in these two sectors, stood at 300, 230 and 220 dollars respectively. The *per capita* incomes of the USA, Canada and New Zealand stand at a much higher figure. The reason is apparent from the preceding pages: natural resources of these countries *per capita* are comparatively far greater than those of Japan. In fact, Japan has the highest population density in the world per square mile of arable land and has little or no mineral resources. When to this basic fact of her economic life we add the circumstance that she has recently lost all her colonies and dependencies, it can be safely predicted that the percentage of her agricultural population is not likely to go down below the existing number of 44 or 45, that is, her national income *per capita* is not likely to go up or will go up only slowly and with great difficulty. She will need to keep comparatively a large percentage of her workers on the soil, because, to repeat, more men working on a given land area produce a greater total of food than fewer men. India now faces the same prospect: there should be no illusions on this score. Her pace of industrialisation will be slow and the standard of living will not rise with industrialisation as fast and to the extent as if she had a smaller initial density or more natural resources and faced a less rapid population growth.

Japan has low *per capita* income and, therefore, low standards of living because she pays low wages to her workers in order to keep down the cost of her industrial product so that it may compete in external markets. Otherwise, she will not get raw materials for her factories which she has to do from outside. Ultimately it is the physical resources of a country which matter and set her economic standards. We may, therefore, continue to be comparatively a poor people even after the proportion of men and women engaged in industry, trade and transport, that is, in secondary and tertiary occupations, has increased at the expense of agriculture and allied occupations.

It is said on the experience of Australia, Argentina, USA, Canada and other western countries that when we succeed in achieving industrialisation on the latest pattern—when energy will be derived from atom, not from coal, and automation and the electronic eye will require fewer hands to operate 'giants'—the largest employment will be found not in the agricultural or industrial sector, but in the service sector. This, however, is a mistake. No draught power, chemical discovery or mechanical invention being able to increase production in the sphere of agriculture a hundred-fold as it is in the sphere of manufacturing, the largest proportion of the Indian population, looking to our meagre land and other material or physical resources, will always remain engaged in agriculture rather than in either of the other two sectors. India, therefore, can never aspire to attain the material standards of these countries.

To conclude, therefore: broadly speaking, the economic conditions of our country are an expression of the relation that its physical resources and the level of their exploitation bear to the size of its population and the rate of population growth. Although the extent of the physical resources is a factor beyond human control, the level of their exploitation can vary and be raised. Similarly, although we can do nothing about the existing size of our population, at least, its rate of growth can be checked. We have, therefore, to address ourselves to the tasks which alone are open to us, *viz.*, to better exploitation of our physical resources and to checking the growth of our human 'resources', which will improve our economic conditions.

CHAPTER XX

SOIL UTILIZATION

It has already been seen that under existing conditions in India where land is limited and labour so plentiful, we cannot but have intensive farming—a system of small farms in which relatively more labour is employed per unit of land and the object is to realise the highest yield per acre. It is a case of Hobson's choice: even if we would, we cannot have extensive farming—a system in which relatively less labour is employed per unit of land and the object is to realise the highest net return per man. We have already discussed why production per acre rises with the decrease in the area of a farm. Reference has also been made to the data for Chinese intensive agriculture, given in John Lossing Buck's *Land Utilization in China,* which show that increase in average production per acre continues up to the place where each worker has 2.5 acres.

More men working a given land area result in more product per acre and more total product, and fewer men result in less product per acre and less total product. If the reader turns back to the table entitled 'Illustration of the Law of Diminishing Returns' on page 27, it will be observed that, with 18 men working the 100 acres, though they produce relatively little per man, there is relatively high average productivity per acre and a high total production. If 9 of the 18 men are taken off from the 100 acres, the average productivity of the 9 that are left is higher. But the average production per acre and, therefore, the total production are now only about 68 per cent of what they were with 18 men working those 100 acres. When we reduce the number of men per unit of land, we find that, though the *per capita* productivity of the remaining farmers increases, the total production decreases, that is, *per capita* production or availability of food averaged over the total population is reduced, obviously because those who left the villages and moved to the towns for factory jobs would still be a part of the total population and be in need of food. So, if the 68 per cent is an ample supply for all the 18, then, since the men in towns will make useful goods, the diversification of occupations to include manufacturing would be advantageous provided the factory product could all be sold year after year. But if that 68 per cent of former total production were not enough to go around among both the factory workers and peasants still on the land, then the change would mean

still higher food prices and still greater poverty, that is, still lower level of food consumption.

In so far as standard of living is judged by the use of commodities other than food, factory production would appear to make for a higher standard. Since, however, it does not increase the amount of food available for the people, it is no remedy of the misery that arises from the shortage of food. Human energy in our country must, therefore, concentrate on that one objective, FOOD, because it is the prime necessity, that is, the land must be worked intensively—must be worked far down the scale of diminishing returns—in order to provide enough food. A policy of reliance on an international market to sell our manufactured products in, and to buy food from, will not be a wise policy. As time passes, countries from which we purchase our food today, with increase in their population, and erosion of their soil, will not be able to sell it to us any longer, nor will countries in which we sell our manufactured products today, with their inhabitants increasingly taking to manufacturing and the policy of their Government aiming at self-sufficiency, buy our manufactured products any longer.

Says Dr. Elmer Pandell:

> There seems to be a widespread illusion about the depth and stability of industrial prosperity. The industrial revolution has been a cause of confusion in many minds concerning the relation of men to earth. The reason is that while there has been surplus food, anywhere, it could be drawn to the areas where the industrial revolution was most advanced. The people with extra food were glad to sell their surplus in order to get the purchasing power to buy the products of the machines. Actually the people working with the machines have often, if not usually, been better off than those who produced the food. But that advantage could apply only when food was in surplus. When food is scarce, those who produce it have the advantage. In the years of scarcity that lie ahead, the people who have come to depend on other lands for food have painted themselves into a corner. Assembly lines, power shovels, fast autos and airliners—those are toys and trinkets; a man must eat.[1]

Size of population in countries which possess comparatively little land relative to their population today but which got a start by exploiting labour of other peoples and natural resources of other countries and are at present maintaining themselves with food obtained in exchange of industrial goods which they are able to produce with the specialized equipment and specialised skills, will ultimately, that is, when other countries will also have been industrialized, be governed by the amount of food they are able to produce in their own country.

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[1] *Population on the Loose*, New York, 1951, p. 34.

Table XXXVI

Yields per acre in certain Countries

(cwt. per acre)

	Wheat				Barley				Oats			
	1934-35 to 1938-39	1946-47 to 1950-51	1951-52 to 1955-56	1956-57	1934-35 to 1938-39	1946-47 to 1950-51	1951-52 to 1955-56	1956-57	1934-35 to 1938-39	1946-47 to 1950-51	1951-52 to 1955-56	1956-57
UK	18.4	19.7	23.5	24.8	16.7	18.5	22.2	24.2	16.3	16.9	19.4	19.5
Canada (*a*)	5.6	8.3	11.7	13.5	8.4	9.6	12.2	13.6	7.4	9.2	11.8	13.5
Australia (*g*)	6.4	7.8	9.4	9.3	7.4	8.8	9.5	8.7	3.9	5.2	5.3	5.0
India	5.6(*b*)	5.0	5.8	5.7	6.7(*a*)	6.3	6.6	6.7	...	...	...	...
Pakistan	6.6(*b*)	6.8	6.2	5.9	6.2(*a*)	4.1	5.0	5.1	...	...	...	...
USA	6.9	9.0	9.5	10.7	9.2	11.1	11.9	12.4	7.8	9.7	9.9	9.8
Argentina	8.0	9.2	10.1	...	8.9	9.5	10.3	...	7.8	8.6	9.9	...
Denmark	24.2	27.3	29.4	31.7	23.7	25.8	28.1	29.3	21.4	23.7	26.4	26.4
France	12.2	13.1	16.6	16.8	11.5	11.8	14.8	23.2	11.1	10.6	12.9	16.3
Western Germany ...	18.2c	15.4	22.3	24.1	18.3(*c*)	15.4	20.8	21.6	16.0(*c*)	14.5	19.8	20.5
Sweden	19.3	16.5	17.3	18.9	16.9	16.4	17.4	20.5	15.6	12.2	13.0	16.8

(contd.)

TABLE XXXVI—(*concld.*)

	RYE				MAIZE				RICE			
	1934-35 to 1938-39	1946-47 to 1950-51	1951-52 to 1955-56	1956-57		1934-35 to 1938-39	1946-47 to 1950-51	1951-52 to 1955-56		1934-35 to 1938-39	1946-47 to 1950-51	1951-52 to 1955-56
UK	10.9	15.2	18.3	19.2	India	5.9(*b*)	5.1	5.9	India	7.2(*b*)	6.2	6.4
Canada	4.8(*a*)	5.6	9.1	7.7	Pakistan	8.7(*b*)	8.1	8.1	Pakistan	7.5(*b*)	7.4	7.1
					S. Africa	5.9(*e*)	5.8(*e*)	7.9(*e*)	Australia	23.1	23.9	27.3
USA	6.1	6.1	6.6	6.6	S. Rhod. (*d*)	10.4	8.4	13.1				
Argentina	5.2	4.9	6.3	...	Canada	20.5	22.8	23.4	USA	12.9	12.6	14.9
Denmark	14.2	17.4	19.8	20.8					Brazil	7.4	8.3	7.6
France	9.2	8.8	9.1	10.0	USA(*f*)	11.2	18.8	20.0	Italy	27.8	24.0	26.8
Western Germany ...	14.7(*c*)	14.9	19.3	20.1	Argen.	14.9	14.5	12.7	Burma	7.6	7.5	7.9
Sweden	15.4	14.6	16.3	17.6	Brazil	11.5	10.2	9.6	Indo'sia	8.6	...	8.5
Turkey	8.3	7.0	8.2	7.1	Italy	17.4	13.1	18.3	Japan	20.9	23.5	23.2
Yugoslavia	6.5	7.4	7.0	6.5	Yugo'via	14.4	11.4	10.8	Thailand	8.1	6.8	6.8

(*a*) The 'long-time' Canadian averages reported in 1940 were as follows: wheat 9.2 cwt. per acre; barley 10.8 cwt; oats 10.8 cwt; and rye 8.1 cwt.

(*b*) Average 1936-37.

(*c*) Estimate for comparable pre-war area.

(*d*) European cultivation only.

(*e*) Averages for less than 5 years.

(*f*) Maize harvested for grain.

(*g*) Per sown acre.

Source:—Commonwealth Economic Committee—Grain Crops —A review, London 1957, published by Her Majesty's Stationery Office.

TABLE—XXXVII

Average Yield per Hectare (1948-53) *of Important Crops in Different Countries*

Sl. No.	Countries	Yield in 100 kgms. per Hectare															
		Cotton Seed		Wheat		Groundnut		Tobacco		Barley		Maize		Rice (Paddy)		Potato	
		Actual	Relative (India =1)	Actual	Relative (India =1)	Actual	Relative (India =1)	Actual	Relative (India =1)	Actual	Relative (India =1)	Actual	Relative (India =1)	Actual	Relative (India =1)	Actual	Relative (India =1)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1.	India	1.8	(1.0)	6.8	(1.0)	7.5	(1.0)	7.3	(1.0)	7.9	(1.0)	6.7	(1.0)	11.5	(1.0)	70.5	(1.0)
2.	Australia ...	3.0*b*	(1.7)	11.4	(1.7)	10.3	(1.4)	9.2*a*	(1.3)	9.9	(1.3)	17.6	(2.6)	47.8	(4.2)	93.7	(1.3)
3.	New Zealand ...	...	...	27.5	(4.0)	...	...	14.0	(1.9)	22.7	(2.9)	37.2*a*	(5.5)	...	...	145.4%	(2.1)
4.	Union of S. Africa	...		5.3 †£	(0.8)	...	...	...	...	7.9 *c*	(1.0)	8.5*a* *	(1.3)	...	...	44.0*d*	(0.6)
5.	Egypt	9.9	(5.5)	18.7	(2.8)	16.9%	(2.3)	...	...	19.6%	(2.5)	21.1	(3.1)	36.9	(3.2)	152.5	(2.2)
6.	China (22 Provinces)	3.5*	(1.9)	10.1*a*	(1.5)	...	...	10.9 *&	(1.5)	11.1	*c* (1.4)	13.5*a*	* (2.0)	25.0*e*	* (2.2)	55.0*e*	(0.8)
7.	Japan	2.3*c*	(1.3)	18.8	(2.8)	13.6	(1.8)	16.8%	(2.3)	21.0	(2.7)	14.2	(2.1)	39.1	(3.4)	119.2	(1.7)
8.	Turkey	4.6	(2.6)	10.4	(1.5)	18.3	(2.4)	7.2	(1.0)	11.3	(1.5)	12.4	(1.8)	35.6	(3.1)	78.3	(1.1)
9.	Canada	...	...	13.3	(2.0)	...	...	14.6	(2.0)	14.8	(1.9)	32.6	(4.9)	...	...	125.8	(1.8)
10.	USA	5.6	(3.1)	11.3	(1.7)	9.7‡	(1.3)	14.2	(1.9)	14.4	(1.8)	24.4	(3.6)	26.2	(2.3)	162.5	(2.3)
11.	Mexico	5.8	(3.2)	9.1	(1.3)	12.0	(1.6)	10.0	(1.4)	7.2	(0.9)	7.6	(1.1)	17.6	(1.5)	46.0	(0.7)
12.	Argentina ...	4.8	(2.7)	11.3	(1.7)	9.7	(1.3)	10.3	(1.4)	12.1	(1.5)	15.4	(2.3)	31.0	(2.7)	65.8	(0.9)
13.	UK	...	...	27.7	(4.1)	...	...	...	...	25.7	(3.3)	...	...	...	...	193.3	(2.7)

(contd.)

TABLE XXXVII—(*concld.*)

Sl. No.	Countries	YIELD IN 100 KGMS. PER HECTARE															
		COTTON SEED		WHEAT		GROUNDNUT		TOBACCO		BARLEY		MAIZE		RICE (PADDY)		POTATO	
		Actual	Relative (India =1)	Actual	Relative (India =1)	Actual	Relative (India =1)	Actual	Relative (India =1)	Actual	Relative (India =1)	Actual	Relative (India =1)	Actual	Relative (India =1)	Actual	Relative (India =1)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
14.	Federal Republic of W. Germany	...	...	26.3	(4.1)	...	...	24.6*h*	(3.3)	24.2	(3.1)	23.0*i*	(3.4)	...	...	212.0	(0.3)
15.	France	...	...	18.9	(2.8)	...	...	17.6	(2.4)	16.5	(2.1)	14.9	(2.2)	35.8%	(3.1)	127.8	(1.8)
16.	Belgium ...	...	...	32.3*g*	(4.8)	...	...	22.9 &	(3.1)	30.1	(3.8)	39.0	(5.8)	...	...	232.2	(3.3)
17.	Netherlands ...	...	...	37.0	(5.4)	...	...	...	...	32.4	(4.1)	32.4	(4.8)	...	...	255.8	(3.6)
18.	Denmark ...	...	...	37.0	(5.4)	...	...	8.6*g*	(1.2)	34.5	(4.4)	...	...	...	...	190.3	(2.7)
19.	Italy	3.0	(1.7)	15.9	(2.3)	17.9	(2.4)	13.5	(1.8)	10.6	(1.3)	19.5	(2.9)	49.1	(4.3)	71.2	(1.0)
20.	Yugoslavia ...	2.0	(1.1)	12.2*j*	(1.8)	8.5%	(1.1)	7.3	(1.0)	10.5	(1.3)	13.8	(2.1)	25.4%	(2.2)	67.8	(1.0)
21.	Greece	6.3	(3.5)	10.6	(1.6)	19.1	(2.5)	5.9%	(0.8)	10.5	(1.3)	9.4	(1.4)	32.3%	(2.8)	110.3	(1.6)
22.	Norway	...	...	20.6	(3.0)	...	...	...	...	23.4	(3.0)	...	...	...	...	200.5	(2.8)
23.	Sweden	...	...	21.7	(3.2)	...	...	...	...	22.3	(2.8)	...	...	...	...	136.3	(1.9)
24.	Switzerland ...	...	...	26.4*g*	(3.9)	...	...	19.4	(2.7)	24.7	(3.1)	31.0	*d* (4.6)	...	...	182.2	(2.6)

* Unofficial figures. @ Average of 1949-53. & Average of 1948-49 and 1951-53. % Average of 1948-50 and 1952-53.
£ Average of 1948-51 and 1953. † On farms and estates. ‡ Picked and thrashed.
a Average of 1948-52. *b* Average of 1951-53. *c* Average of 1948-51. *d* Average of 1948-50. *e* Average of 1948-49.
f Average of 1949-50 and 1952-53. *g* For 1948 only. *h* Average of 1948-50. *i* Average of 1948-52. *j* Includes spelt.

Source:—F. A. O. Year Books 1953 and 1954.

The two tables on pages 241 to 244 *ante* culled from different sources, showing the average production of various agricultural commodities in some of the countries of the world, prove that India's production is almost the lowest all along the line.

According to the Census Report of 1951, India was normally surplus in food-grains in or about 1880, including both rice and wheat, and the surplus was of the order of 12 lakh of tons per annum. Figures for subsequent years which are available, averaged over five-year periods, are as follows:—

TABLE XXXVIII (In Lakh Tons)

Five-year period	Exports	Imports	Net Exports
1890–91 to 1894–95	14.5	2.1	12.4
1895–96 to 1899–1900	11.0	4.8	6.2
1900–01 to 1904–05	16.6	6.2	10.4
1905–06 to 1909–10	14.8	9.6	5.2
1915–16 to 1919–20	15.9	11.9	4.0

1915-20 was the last five-year period when undivided India was a net exporter of food-grains. Thereafter, there was net import during every five-year period as shown by the table below:—

TABLE XXXIX (In Lakh Tons)

Five-year Period	Imports	Exports	Net Imports
1920–21 to 1924–25	11.4	9.8	1.6
1925–26 to 1929–30	15.9	8.3	7.6
1930–31 to 1934–35	18.4	5.7	12.7
1935–36 to 1939–40	20.7	6.9	13.8

The subsequent changes during and since World War II may be briefly narrated. During 1940-41 and 1941-42 net imports diminished to 9.6 lakhs and 4.3 lakhs. During 1942-43 imports were cut off and India supplied Ceylon and a few other places; net exports reappeared for about one year though the quantity was small—only 2.9 lakhs. The Bengal Famine occurred during 1943-44 when India received, under international allocations, a net supply of 3.0 lakhs. The next two years were managed with imports of only

7.3 and 9.3 lakhs of tons. The shortage was made good mainly by eating into the carry-over; the stocks normally carried by farmers, traders and consumers were reduced, thus adding greatly to the difficulties of distribution, and creating the risks of break-down which was the nightmare of 1946. The first full post-war year, 1946-47 saw India importing 25.8 lakhs and the next year, 1947-48, 26.6 lakhs. At this stage, the agitation against state trading commenced. These imports seemed to be both enormous and unnecessary; hence the demand for stoppage of imports and lifting of controls. This did not, however, work. During 1948-49 the first full year after partition, India imported 30.5 lakhs. Then it was reduced to 28.6 and 27.2 lakhs. This was followed by two successive years of very large imports. The report of the Planning Commission mentions 32.7 lakhs as the average level of imports per annum during 1947-52.

Shri V. M. Dandekar[1] gives the following figures of imports—

TABLE XL

Net Imports of Foodgrains in India

(In Lakh Tons)

Year	Rice	Wheat	All cereals
1936-39 (Average)	17	4	21
1944	2	13	16
1945	5	13	18
1946	6	14	26
1947	7	9	27
1948	9	13	28
1949	8	22	37
1950	4	14	21
1951	7	31	47
1952	7	25	39
1953	2	17	20

There is, however, another view of the whole matter according to which the cry of food shortage, at least, until a decade ago, was the result of faulty reasoning based on wrong data, and whatever

[1] *Use of Food Surpluses for Economic Development* by V. M. Dandekar, Gokhale Institute of Politics and Economics, Poona, 1956.

under-nourishment and even under-feeding there was, it was due to low purchasing power of large segments of our population. According to an essay written by Shri P. C. Bansil, entitled *Indian Food Resources And Population*, published in the *Eastern Economist*, the analysis made by Dr. P. J. Thomas, who took a period of 30 years and worked on Fisher's weighted aggregated index method is revealing. His conclusion was that whatever period is taken, population did not outstrip production at any stage:—

TABLE XLI

Period	Population	Agricultural Production
1900-01 to 1904-05	100	100.0
1905-06 to 1909-10	104	103.0
1910-11 to 1914-15	107	123.5
1915-16 to 1919-20	103	124.5
1920-21 to 1924-25	109	120.0
1925-26 to 1929-30	118	120.0

Dr. Thomas and Shastri have again proved that during the period 1911-1934, while population increased only by 12 per cent, increase in agricultural production was of the order of 20 per cent.

Imports of Burma rice were due to their cheapness as compared with the indigenous variety, and not to any shortage. Mahatma Gandhi rightly pointed out that the import of Burma rice was 5 per cent of Indian production while the loss entailed in polishing came to 10 per cent. As for wheat it was being exported and was, in fact, rotting at Lyallpur, because when transported to Calcutta, it was dearer than the Australian wheat, on which an import duty of Rs. 2/- per maund had been levied in March, 1931. Crop-Planning Sub-Committee, 1934, was thus forced to cry halt to any further expansion of rice cultivation.

It was the War and the Bengal Famine that brought the question of the food resources of India to the fore-front. It may, however, be added that the Bengal Famine was not so much due to the actual food deficit, resulting from poor crops in Bengal and from the loss of imports from Burma, Siam and Indo-China, as to the breakdown of transport because of military demands, the inflation of prices because of wartime conditions, and the hoarding of grain because of profiteering and insecurity.

Shri Pheroze Kharegat made an elaborate and exhaustive study in 1946. He vividly highlighted the then food resources as shown in the table below:

TABLE XLII

	Quantity reqd. for a balanced diet	Quantity available	Total quantity required	Total quantity available
	(in ounces per day per adult)		(in million tons for the whole nation)	
Cereals	16	18.5	48.0	55.5
Pulses	3	2.5	9.0	8.5
Sugar	2	1.8	6.0	5.3
Vegetables	6	3.0	18.0	9.0
Fruits	2	2.0	6.0	6.0
Fats & Oils	1.5	0.6	4.5	1.9
Whole Milk	8*	1.5	32.0	6.3
Butter Milk	...	3.0	...	12.5
Meat, Fish, Eggs	2 to 3	0.5	6 to 9 ...	1.5

* Per capita

Any way if we were short of anything, concludes Shri P. C. Bansil, it was in milk, meat, fish, eggs, pulses and vegetables. The Diet Survey Report for the period 1935-48 confirms that the cereal consumption in the country has been more than what is required on the basis of nutritive levels. But the Government continued to harp on the old tune of increasing our cereals. Instead of exploring our real resources, the Food-Grains Policy Committee, 1943 had already recommended an immediate import of foodgrains. This resulted in increasing our food imports from 6,49,000 tons in 1944 to 2,225,000 tons in 1946.

Shri P. C. Bansil goes on to point out that subsidiary foods are also as good as any cereal, which can be grown in *bhur* or sandy areas that are generally of poor fertility. Dr. P. J. Thomas while speaking on the subject said:

> In all thickly populated countries, carbohydrate requirements are not all drawn from cereals, but also from tubers, which are easy to raise and heavy yielders. In the colder Western countries it is the potato, in the warmer countries of South-East Asia it is tapioca.

It is an admitted fact that the whole production of potato and sweet potato is consumed by human beings and practically simi-

lar is the position regarding other subsidiary foods like groundnut, tapioca, yam, papaya, turnips, carrots, banana, cocoanut, cassava and parsnips. According to the Marketing Report on Groundnut 1941, nearly 7 per cent of it is consumed for edible purposes. Dr. A. T. Simens quotes Prof. B.G.S. Acharya as saying:

> It (groundnut) ranks with the microbial protein of yeast and closely approximates animal protein as found in milk, eggs and mutton.
>
> He concluded that with nearly 1½* million tons of its production, India can make available some 7 lakh tons of the finest food from this crop. Prof. D. L. Sahasrabudhe is all full of praise even for groundnut cake, which he says is a highly nutritious food material for human consumption.

The other important tuber, tapioca, which has been named as 'Kalp Vriksha' after cocoanut, is for the working classes, what 'manna' was to the worn-out Israelites in the wilderness. A recent report on tapioca states that:

> Today the population of Travancore draws more of its food requirements from tapioca than from rice and wheat.

In Malabar, tapioca is extensively grown and is consumed as a substitute for and a supplement to rice. Hyderabad also along with tapioca has introduced *coorka* (Chinese potato). These two crops are now being grown there practically in every district. Dr. V. Subrahmanyan has prepared synthetic rice the digestibility of whose protein has been calculated by him at 90 per cent.

We have yet other foods like *singhara* (paniphal) whose cultivation is known from ancient times and whose food value compares quite favourably with wheat. *Ain-i-Akbari* (1590) mentions levy of revenue on this crop. Even today U.P., Madhya Pradesh, Bihar and Kashmir have large areas under it. Another hitherto neglected food is mango seed kernel. Mahatma Gandhi said that it is rich in carbohydrates and fats, and can make available every year some 70 million lbs. of digestible protein and 780 million lbs. of starch.

But in spite of all that has been so forcefully said by Shri P. C. Bansil, the need for increasing agricultural production remains and is insistent. For, population continues to increase and the rate of increase since 1951 has been more rapid than previously. Also, granting that there is enough food to go round the whole population in the country today, we have to so increase our production per acre that there is a surplus to the needs of the farmers. For, as already noticed, unless there is a surplus, there will be no develop-

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* To-day the annual production of ground-nut in the country is of the order of 4 million tons.

ment of non-agricultural resources—no industry, no commerce and, therefore, no transport, or social services.

We are said to have increased our gross agricultural output during the First Five-Year Plan by 13.5 per cent, but it would appear that most of the increase in production so far has been due more to favourable weather and extension of acreage than to actual augmentation of yield per acre of cultivated area due to technological improvements. The table on pp. 241-242 shows that our yield has actually been diminishing or is just static—compared to the pre-war years. The yield of wheat dropped from 5.6 cwts. per acre in the pre-war years to 5.0 cwts. in the first post-war quinquennium. The yield of rice has fallen from 7.2 cwts. in the pre-war years to 6.2 cwts. in the first post-war quinquennium and rose to 6.4 cwts. during 1951-56. The present yields of maize and barley are barely equal to the pre-war figures. Significantly enough, almost all Western countries and Japan in Asia have achieved substantial increases in their agricultural yields during the same period.

During the eleven years ended August 15, 1958, that is, since we attained independence we have been forced to spend as much as Rs. 1,475 crores on purchasing the marginal supply of food. Nor does the future hold any cheerful prospects. According to the Foodgrains Inquiry Committee (1957), given normal conditions, the demand for foodgrains in 1960-61 will be of the order of 79 million tons, while the production will be 77 million tons. There will be thus a deficit of about two million tons per year even at the end of the Second Five-Year Plan. If there is a sharp inflationary trend, the demand may be even higher; while if there are adverse weather conditions, the production may be substantially lower. Moreover, there may be additional demand on account of variations in propensity to stocks. The Committee, therefore, felt that even in a normal year, there will be need for importing two to three million tons of foodgrains per annum during the next several years.

Unfortunately, we have in the past not given in our schemes and calculations the importance to agriculture to which its place in our economy should entitle it. Until very recently it has been common in our country to emphasise industrialisation, giving it priority over agriculture. The total outlay on industries in the Second Plan was stepped up by 5 times, the percentage of increase being from 7 to 19. But the percentage outlay on agriculture went down from 33 per cent of the total in the First Plan to 21 per cent in the second. It was a mistake: by doing so we have been putting the cart before the horse. Food is the first necessity of man and in India it is not available today to all in the quantity needed. The modern conveniences in the cities, hospitals, roads, education, housing

and even clothing can wait, but not food. Food shortage is likely to lead to political instability. With the population growing by five million (if not more) every year and Indian agriculture not yet capable of feeding all the existing population, there is real danger of mass starvation just over time's horizon. "A hungry people", said an ancient Roman philosopher, Seneca, "listens not to reason, nor cares for justice, nor is it bent by any prayers". It will lend a sympathetic ear to the promises of Communism, and will be prepared to sacrifice freedom for bread. Whether Communism, with a far lower land-man ratio in India than in the USSR, would necessarily solve the food problem earlier than a democracy that we are today, will be clear from the confession of Messrs. Khrushchev and Bulganin at the 20th Congress of the Communist Party in 1956 that there had been a deplorable failure of agriculture and consumer goods industries even after the successful completion of five successive five-year plans. But this truth will dawn upon our people when it would have become all too late.

Hence agriculture, at least, immediately is more important than industry—more important than giant steel or hydro-electric projects and heavy or producer goods industries. The importance of increased agricultural production would be indelibly impressed on our minds if we remember that the three steel plants at Durgapur, Bhilai and Rourkela, of which we are so proud, and justly, would ultimately cost us about Rs. 550 crores while we have, in 11 years, following August 15, 1947, imported food worth Rs. 1,475 crores. Had we grown our own food, we could have put up eight steel plants of equivalent size for nothing!!

Industrialisation cannot precede but will follow agricultural prosperity. Surpluses of food production above farmers' consumption must be available before non-agricultural resources can be developed. Where the surpluses do exist, the villages tend to become cities. Where food surpluses are not present, or are not easily available, villages must remain villages, and the cities must remain few. "Wherever the fertility of the soil, or the state of agricultural arts has produced a surplus of food and raw materials beyond the needs of the producers", says Roland R. Renne, "towns and cities have developed".[1] A comparison of the western and eastern parts of the State of Uttar Pradesh in India will confirm this conclusion: there are more towns and cities in the west which produce food surplus to the needs of the farmers, than in the east which has no food surplus.[2] People moving to the non-agricultural jobs in the

[1] *Land Economics*, Harper, 1947, p. 57.

[2] In the eastern and western districts of Uttar Pradesh production per acre is almost equal; yet while there are substantial surpluses or food surplus to the needs of the farming population in the latter, there are little or none in the former.

cities and towns must have food. Where there is scarcity of food, the Law of Diminishing Returns will compel them to remain on land.

Our farmers have to produce agricultural goods in quantities not only which will just suffice for themselves, but which will prove surplus to their own consumption needs, feed those who are engaged in running the industries and in the service sector, provide raw material for our manufacturing industries, and thus furnish purchasing power to the farmers themselves so that most of the goods produced by the industrialists get sold within the country itself.[1] Increased agricultural production will also obviate import of food from outside thus saving foreign exchange which is so essential for other purposes, and, as we have seen in the last chapter, will release workers from agriculture for transference to industrial and tertiary employments. This will, incidentally, increase the landholdings of the remaining farmers thus permitting large surpluses for the markets and larger *per capita* income for the farmers. To the extent that markets are available, we have also to produce export crops with which to pay for imports of more capital goods for industrial development.

If we cannot produce natural raw materials to feed the factories and food-stuffs to feed the workers, but have to import them, even the existing factories in the country will have to close down, sooner or later. Food imports mean higher food prices, and as food constitutes the largest item in a poorman's or worker's budget, these imports mean higher production and transportation costs. Our factory products will, therefore, not be able to compete in foreign markets, as our textile manufacturers are already finding it to their dismay, their markets being rapidly captured by cheaper Chinese and Japanese textiles. Ginning factories standing idle or dismantled in various towns of southern and western Uttar Pradesh are a grim reminder of the truth that it is agricultural (and mineral) produc-

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The reason is that in the eastern region more men are engaged in farming the same area of land than in the western. More men in the eastern region are producing only as much per acre as fewer men in the western, because, in the latter, farming practices are superior, capital employed per man is greater and farmers individually work harder. In other words, greater capital investment, improved farming practices and harder individual work in the west are being balanced by application of more hands, or by putting more men on the same area in the east. Only if and when mental attitudes of people in the eastern districts change, that is, they come to have an urge for material prosperity and, to that end, put in greater efforts both of mind and body, farming practices are improved, more capital in land is invested, and ravages of Nature become less frequent or they are cancelled, or, at least, minimized by human effort, will men be released from agriculture for employment in industries and services and per capita income rise or economic conditions in the region improve.

[1] Shoes do not grow in fields. So, a farmer who does not grow a commercial crop or food surplus to his needs, will not be able even to have a pair of shoes.

tion which is the key to economic or industrial growth. With the inability of our farmers to produce raw materials to feed the factories, and food-stuffs surplus to their own consumption, also shrinks or disappears the internal market which, if and when developed, could keep tens of times the present number of industrial enterprises working, and, to repeat, which in the USA absorbs 95 per cent of her total production that is equivalent to one-third of total production of the world.

Better and more food is necessary for yet another reason. If allowance is made both for quality and caloric content, the average *per capita* diets of North America, Oceania and West Europe are something like one and a half to two times those of India. The average daily calorie supply *per capita* in our country is only 1,600 or so, as against the 2,200 accepted by the FAO in its Second World Food Survey of 1952 as a daily minimum standard, or the 3,000 and 3,200 actually enjoyed by Canada and Switzerland respectively. This inevitably means that the majority of our people are habitually or permanently under-nourished, incapable of achieving full growth, health, or energy. An improvement in nutritional levels, therefore, is a primary condition for economic development, for without it there can be no improvement in the quality of labour. Thus we find ourselves in a vicious circle: lack of more and better food lowers our efficiency, which, in turn, limits our productivity of food.

The very fact that the yield per acre in India today is very much lower than that in some countries with comparable climatic and soil conditions shows that it is capable of vast improvement. India contains some tracts of the richest land in the world and small size of the holding is not an obstacle to increasing the yield per acre as the experience of China and Japan would show.

Japan has proved that it is possible to utilize science, and all that science has placed at the disposal of man, equally well on small farms as some of the Western countries have utilized it on large farms. The emphasis in Japan is on maximising yield per unit of land by substituting land as much as possible by capital and labour. Although production and distribution are on an individual basis, the State has provided so many facilities by way of highly developed transport and marketing organisations, easy credit, national research and extension services, etc., that the yields per unit of land on the tiny farms of Japan are today among the highest in the world. Each farm is run as a small business and within his limited means the Japanese farmer is as anxious to make the fullest use of modern technology as large farmers in other parts of the world.

"Given three tracts of land of equal inherent productivity," says J. D. Black, "one in Japan, one in China and one India, and

each farmed at the state of the agricultural arts that is average for these countries, the Japanese tract will produce roughly a half more than the Chinese tract and the Chinese tract roughly twice as much as the Indian tract."[1]

As for reasons of our low yields: Considering the high level of cultivation and craftsmanship often achieved by an Indian peasant, it will not be just to attribute the low yield of our agriculture to his shortcomings alone. Dr. Wallick, who was Superintendent of the East India Company's Botanical Garden at Calcutta, giving his evidence[2] on the state of agricultural arts in India on the 13th August, 1832, before the House of Commons' Committee, said:

> The husbandry of Bengal has in a great measure been misunderstood by the Europeans out of India. The Bengal husbandry, although in many respects extremely simple and primeval in its mode and form, yet is not quite so low as people generally suppose it to be, and I have often found that very sudden innovations in them have never led to any good results. I have known, for instance, European iron ploughs introduced into Bengal with a view to superseding the extremely tedious and superficial turning of the ground by a common Bengal plough. But what has been the result? That the soil which is extremely superficial, as I took the liberty of mentioning before, which was intended to be torn up, has generally received the admixture of the under-soil, which has deteriorated it very much.

Asked if the Indian husbandry was susceptible of any great improvement, Dr. Wallick replied: "Certainly, but not to so great an extent as is generally imagined; for instance, the rice cultivation. I should think, if we were to live for another thousand years, we should hardly see any improvement in that branch of cultivation."

In 1889 Dr. Voelcker, Consulting Chemist to the Royal Agricultural Society of England, was deputed to India to make inquiries and suggest improvement in respect of Indian agriculture. And he wrote:

> On one point there can be no question, *viz.* that the ideas generally entertained in England, and often given expression to even in India, that Indian agriculture is, as a whole, primitive and backward and that little has been done to try and remedy it, are altogether erroneous.... At his best the Indian Ryot, or cultivator is quite as good as, and in some respects the superior of, the average British farmer; whilst, at his worst, it can only be said that this state is brought about largely by an absence of facilities for improvement which is probably unequalled in any other country, and that the Ryot will struggle on patiently and uncomplainingly in the face of difficulties in a way that no one else would.

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[1] *Introduction to Economics for Agriculture*, 1953, p. 344.

[2] Evidence before the Commons' Committee, 1832, Vol. II, Part I, p. 195, quoted in *The Economic History of India*, (Early British rule) by Romesh Dutt, Kegan Paul, Trench, Trubner & Co. Ltd., London, p. 277 (Sixth edition).

> Nor need our British farmers be surprised at what I say, for it must be remembered that the natives of India were cultivators of wheat centuries before we in England were. It is not likely, therefore, that their practices should be capable of much improvement. What does, however, prevent them from growing larger crops is the limited facilities to which they have access, such as the supply of water and manure. But, to take the ordinary acts of husbandry, nowhere would one find better instances of keeping land scrupulously clean from weeds, of ingenuity in device of water-raising appliances, of knowledge of soils and their capabilities, as well as the exact time to sow and to reap, as one would in Indian agriculture, and this not at its best alone, but at its ordinary level. It is wonderful, too, how much is known of rotation, the system of mixed crops and of fallowing. Certain it is that I, at least, have never seen a more perfect picture of careful cultivation, combined with hard labour, perseverance and fertility of resource, than I have seen in many of the halting places in my tour.[1]

Nearly 50 years later Sir John Russell, author and expert of international repute, said: "The Indian Ryot compares favourably with any of the peasant populations I have met in different parts of the world."

The opinion of Dr. Wallick, Dr. Voelcker and Sir John Russell is borne out by the report of the Krishnappa Delegation to China which, on comparing the yields in certain farms and regions in the two countries, observes—

> The crops in the best areas or in best farms in India are no worse than those in the best areas and in best farms in China. For instance, in the State of Mysore, the average yield of paddy is about 2,000 lbs. for the rainy season cultivation as against the all-India average of about 1,100 lbs. But in the Malahalli National Extension Block of that State the average yield of paddy in irrigated areas under improved seeds was, 2,500 lbs. in 1952-53 and has gone up to 4,500 lbs. in 1953-54 and 5,500 lbs. in 1954-55 as a result of extension work. In Ramnagar National Extension Block of the same State, the normal yield is 3,000 to 3,200 lbs. per acre but the Japanese method is yielding as much as 6,000 lbs. per acre. This shows that in India the proportion of indifferent and poor farmers is much greater than in China and that is the main reason why, although our best yields do not compare unfavourably with those in China, our average yield is very much lower. The main problem before our country is, therefore, that of raising the level of the average farmers to that of the best farmers (p. 90).

These quotations are not intended to suggest that there is no scope for further improvement of Indian agricultural practices. Far from it; they only imply that the major explanation of our low agricultural output must be sought for, in the words of Dr. Voelcker,

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[1] Vide *Report of the Improvement of Indian Agriculture* quoted by Romesh Dutt, *ibid*, foot-note, on pp. 277-78.

"in an absence of facilities for improvement which is probably unequalled in any other country."

Fortunately for us, it is only "in any given state of agricultural skill and knowledge", as John Stuart Mill pointed out, that the Law of Diminishing Returns applies—that increase in labour does not increase the product in an equal degree. The law is to a large extent subject to the stipulation that if the soil and crops can be improved, which can be done frequently, if not continuously, a given area will yield more produce. This improvement of soil and plants can be effected by improvement in technology, that is, by introduction of innovations in farming practices through scientific knowledge and by application of more capital.

If the law of constant returns applied to labour in agriculture and production per head were to be maintained as population increases in relation to land, it is self-evident that, inasmuch as, in addition to land, agricultural production requires both labour and capital, there must be an increase either in capital investment, or in order that efficiency of labour or capital or of both may be increased, an increase in improvements in technology at the same rate as increase in population. But, as we have already seen, it is the Law of Diminishing Returns that applies. So, if the rate of increase in capital investment or improvements in technology only equals the rate of increase in population, a decline in output per head is inevitable. To maintain food production per head as population increases, either the proportion engaged in farming would have to rise (so that there would be a decline in the proportion engaged in manufacture and tertiary industries) or there must be an increase in capital investment or improvements in technology at a greater rate than the increase in population. But if production per head had to rise as population increases, the rate of increase in capital investment or improvements in technology must be greater still by an amount more than sufficient to offset the rate at which returns to labour decrease.

The amount of land at our disposal is practically fixed and our population is increasing. So if output of food per head is to rise, the need for capital investment and innovations or improvements in technology is apparent. The fact that from an exporter of food India has become an importer, shows that capital investment and technological improvements in agriculture have not kept pace with increase in population. The Indian farmer has an inadequate supply of land which is getting more and more inadequate with increase in population or agricultural labour as time passes: he can offset the effect of the declining land-man or rising man-land ratio by improving his art or technology and by investing more

capital. It may be pointed out that in actual practice it will frequently not be possible to distinguish between capital investments and technological improvements, for, in most cases the latter will depend on the former. For example, increase in water or manure supply is a technological improvement, but this may require capital investment.

To re-emphasize and remind the reader: fewer men working a given land area, with no difference in farming methods and capital employed per man, result in less product per acre and less total product. Therefore, if we seek economic development of the country, that is, want men to be released from agriculture for diversion to industry, commerce, transport and other non-agricultural occupations, and further, want production not only to be maintained at the present level but increased, while population grows, capital in land will have to be invested in a far greater measure and technological improvements in agriculture effected at a far greater rate than we imagine or have planned for. Once agricultural production is increased, say, doubled, if not trebled—which, let us understand, is not impossible of achievement—industrialisation or development of non-agricultural resources will follow almost automatically. To put it in a nut shell: inasmuch as industrialisation will progress to the extent men are released from agriculture, and men will be released to the extent agricultural production goes up, and agricultural production will go up to the extent agricultural practices improve and more capital invested, industrialisation or economic development of the country turns on improvement in agricultural practices we are able to effect and amount of capital we are able to invest in land.

We have to be clear in our mind about four basic facts if we are intent on finding a correct solution of our low agricultural yields and also of other related problems—firstly, that our agriculture is already labour-intensive; secondly, that when we talk of having intensive agriculture in our country, it is capital-intensive agriculture that is largely meant; thirdly, that capital in this context is not a synonym for large machinery; and fourthly, that our agricultural arts, practices or techniques where they are inferior, will have to be improved, that is, innovations will have to be introduced.

The use of improved farming methods or improvements in technology and greater investment of capital per man are the steps that other countries have consciously or unconsciously taken when they found their population increasing and their area of agricultural land to be limited or diminishing. The Krishnappa Delegation has found that it is exactly on these two points, *viz.*, familiarising the peasantry with still better and improved techniques and investment

of more capital that the Communist Government is laying most stress in China. We, too, will have to do the same.

Dissemination of education and technical knowledge will be needed in most parts of the country in order that the average farmer may be brought to the level of the best. He will have to learn (and practise) the simple arts of Japanese, Chinese and Italian peasants, their methods of manuring and other cultural practices where they are superior to ours. A well-organised movement that will embrace every village, will have to be launched if we intend to inspire the peasant to put forth greater effort both of mind and body. None of our schemes, remedies or measures of agricultural improvement will make any headway unless the interest and enthusiasm of the farmers is awakened and maintained. Once the farmers begin to desire progress almost all difficulties will be overcome, but so long as they are apathetic and disinterested very little can be done.

In order that farmers may be enthused, those entrusted with responsibility will also have to make drastic changes in their outlook towards rural problems. Views and sentiments of the peasant are seldom shared by those at the top: few are of peasant origin or have any connection with the village. This is one reason why we fall for or are unable to break away from the ideas we may have received ready-made from foreign oracles—western oracles till yesterday and eastern today. Had those in whose hands lies the power to make policies in India, their roots laid in the soil of their own country and their fingers on the pulse of their peasantry we could have progressed much faster, at least, in the sphere of agriculture.

In this connection the Patil Delegation has this to say:

> Although a change in the attitude of the administration is noticeable the old system, traditions and outlook have not yet disappeared and it becomes difficult for the administration to function on the basis of trust and co-operation as between equals. Identification with the people is made further difficult by the fact that higher services usually come from higher classes and castes in society.[1]

It is, however, not the officials alone who can work up the necessary enthusiasm amongst the peasantry or owe the responsibility. Rural communities in certain parts of the country tend to expect that whatever is to be done for their improvement is the responsibility of the Government or some outside agency. To change this passive attitude into one whereby people realise that they can do a good deal themselves without outside help, should be the duty as

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[1] Report, pp. 139-140.

the privilege of non-official leaders of the people. We agree with the Krishnappa Delegation when it says:

> Technical measures can be developed by research institutes. They can be taken to the farmers' fields by the extension agency; credit and supplies may be made available to the farmers so as to make it possible for them to adopt the measures recommended. But it is not enough to bring water to the horse. The horse must have a will to drink it. That will can be created no doubt to some extent by the official extension agency but official agencies have also their limitations. The non-official agencies of the country, especially, the political and social organisations, have to take a much greater hand in it than has been done hitherto. Although in some areas of India, farmers are diligent and keen to adopt new techniques, it must be admitted that in many areas they are apathetic and much less hard-working compared to the Chinese farmers. Our peasantry as a whole is not working hard enough nor is it always keen to work efficiently and adopt improved techniques. It is only our popular leaders and popular parties who can effectively revitalise our peasants and unless they do so we are bound to lag behind. On the other hand if a mass enthusiasm is created by non-official workers and there are no extension agencies to follow up, or supplies and credit are inadequate, there may be also serious frustration. It is, therefore, very important that some organisation like Technique Popularisation Stations of China should be set up at the block level in our national extension areas.[1]

It would not be irrelevant to point out here that dignity of labour, without which no wealth can be produced, is foreign to the conception of caste founded on birth. And caste determines attitudes in our society. There is an English adage that 'he that by the plough would thrive himself must either hold or drive;' but manual labour is a taboo to some of the higher castes in certain parts of the country. For example, in eastern Uttar Pradesh, members of some higher castes refuse to wield the plough themselves or to work hard in the field. Nor will their women-folk attend even to their milch-cattle.

Even more than the ignorance of improved techniques, however, it is the absence of credit which impedes the progress of our agriculture. A satisfactory agricultural development often requires amounts comparable with those required for industrial development. It is a great mistake to allot huge funds to factories alone. Food is short in India largely because our peasant lacks the facilities that augment agricultural production—because the proportion of capital invested in land is low. Investment of capital by the farmer himself is, in many parts of the country, extremely small, the chief reason being the poverty of his own resources and the high interest at which alone he can borrow from others. Capital is required, in the

[1] Report, p. 172.

first instance, to provide a greater and more efficiently managed supply of water for irrigation, so that agriculture may not remain at the mercy of the capricious monsoon, and, in the second, to provide for better and adequate manure. Inasmuch as, however, our country suffers from scarcity of capital, emphasis will have to be laid upon comparatively simple and inexpensive techniques as far as possible—not on techniques or technologies which are costly.

Hitherto emphasis has been placed on the sinking of tubewells and execution of large-scale multi-purpose river valley projects which, when completed, will control floods, bring more land under irrigation, generate power for industrial and agricultural use and, in certain cases, improve inland navigation. But tubewells are not a profitable proposition either for the State or for the cultivator who has a tiny holding of, say, less than 3.125 acres or 5 standard bighas and who along with his bullocks remains idle for a large part of the year. Also, if not carefully sited, they may eventually exhaust the sub-soil water reserves, which will adversely affect the soil.

There is another side to the large dams also. By the time they are completed, our population would have grown so much that the wealth they will produce, distributed evenly among the people, would leave them no better off than they were before. Also, we have to remember the danger that such dams, after a period of time, may be filled up with silt. This has happened to hundreds of reservoirs in the United States, Japan, Puerto Rico and Ceylon. Silting up can be avoided only if there is considerable development of afforestation and other sorts of erosion control all through the watersheds above the dams. Also, irrigated land is liable to become clogged with salts from the reservoir water, and to become useless.

Masonry wells, if possible, fitted with Persian wheels, and other small irrigation works like *bundies* or field embankments, which will not lock up capital for any considerable length of time and will give early returns will, perhaps, serve our purposes better. Wells, in particular, will make the cultivator independent of governmental machinery and also provide employment for him and his bullocks.

It is common knowledge that the available irrigation facilities are not put to optimum use in most places. Some of the simple methods which may be adopted to ensure a greater utilization of the irrigation facilities are:

(a) alignment of field channels;
(b) dividing fields into compartments in canal-irrigated areas before irrigation;
(c) keeping channels and *guls* clean; and
(d) keeping the old minor irrigation works, *e.g.* wells and tanks, in good condition, through community efforts.

Irrigation, however, cannot be carried beyond the limits which the supply of available manure warrants. For, irrigated crops trench on the temporary fertility of the soil which must be restored either by manure or rest. Inasmuch as we cannot allow the already large area of current fallow to increase, the only course left is to increase the supply of manure in proportion to extension of irrigation.

In agriculture, it is an axiom that what is taken off the soil, must in some way be put back into it, or else the soil will suffer exhaustion. Soil is like a bank. You cannot take from it more than you deposit. Nature permits no over-drafts.

Nitrogen being the most essential plant nutrient, agricultural output is ultimately determined by the quantum of nitrogen the soil contains. Nitrogen content is determined by its humus content. It is the vast quantities of bacteria contained in the humus, which is another name for colloidal organic matter, that turn the nitrogen of the air into organic nitrate salts to feed the plants. Humus gives life to the soil; without it the soil is, in a way, dead. It is the humus content of a soil, therefore, that ultimately determines its fertility. To keep soil productive it is necessary that humus be replaced as fast as it is consumed or lost.

Every crop that is harvested takes some plant food out of the soil, rather out of its humus content, nor can it draw sustenance from air without the help of micro-organisms contained in humus. Further losses of humus are occasioned by leaching, that is, the removal of soluble plant nutrients by the action of percolating water. Also, humus is liable to more rapid destruction in tropical sunshine than in temperate climates. Thus, there is a constant drain on the nutrient reserves of the soil or its humus content. This loss of organic content of the soil can be made good by man through addition of organic matter in the form of farm-yard waste, night-soil, oil-cake, fish waste, blood-meal, bone-meal, green manure, dry leaves and twigs or other vegetable waste, sewage, tankage, sludge, or compost made of all or some of these organic wastes—human, animal and plant.

Major crops in India today are estimated to remove annually over 3.8 million tons of nitrogen from the land, but the quantity which is reimbursed whether by way of inorganic fertilisers or of organic manures is less than a million tons of nitrogen in a year. According to Sir Albert Howard, a well-known friend of the Indian cultivator, he does more with a little nitrogen than any farmer in the world outside China. The balance of 2.8 million tons of nitrogen or more is made available through the natural recuperative process that takes place in the soil and outside, and through the uncollected waste products of plant and animal life. Where this re-

couping is not possible, the crops draw upon the original endowment of the land itself. "The extra crop in England", says Dr. Voelcker, "is.....the produce of what is added to, and not, as in India ....of what is taken out of it."[1] No wonder then that the fertility of our soil in many a part of the country is gradually declining. On this state of affairs Sir Albert Howard has the following remarks to make:

> The using up of soil fertility is a transfer of past capital and of future possibilities to enrich a dishonest present; it is banditry pure and simple. Moreover, it is a mean form of banditry because it involves the robbing of future generations which are not here to defend themselves.[2]

If we want to bequeath some capital to the posterity, our object must be to more than make up the net loss to the soil bank, for that would only serve to stabilise the soil fertility at its present level. We have not only to conserve the fertility of the soil but also enrich it.

Artificial nitrogenous fertilisers will help irrigated areas but the quantity available in the country is hardly sufficient for a fourth of the present irrigated area of about 70 million acres. Moreover, the use of fertilisers is risky unless they are mixed with large quantities of organic manure. Nor should they be used in areas which depend entirely on rainfall unless the rains are well distributed, and such areas are very few.

The common source of soil nitrogen available in our villages is cattle-dung or farm-yard waste. It is estimated, however, that 40 per cent, more or less, of the total annual production is burnt up for want of cheap fuel. About 20 per cent of the supply is lost because it is not collected, and only 40 per cent of it is left to be used for fertilizing the soil. One estimate places that part of dung which does not go back to the land at 66.6 per cent instead of 60. Implications of this tremendous national waste have been brought out by Shri K. C. Pant in his brochure, *Fertilizers for More Food*,[3] as follows:

> A committee appointed by the Government of India to go into this question came out with the estimate that 200 million tons of dry cowdung having 15 per cent moisture was being burnt each year, the dry weight of this being equal to 170 million tons. Assuming dry dung to contain 0.8 to 1.0 per cent nitrogen, 0.4 to 0.6 per cent phosphorus (P_2O_5) 1.0 to 1.2 per cent potash (K_2O) and 50-60 per cent organic matter, 170 million tons would contain roughly:

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[1] Report of Dr. Voelcker, Consulting Chemist to the Royal Agricultural Society in England, 1889, p. 41.

[2] *Farming and Gardening for Health or Disease* by Sir Albert Howard, (Faber and Faber Ltd., London) pp. 69-70.

[3] Published by *The Hindustan Times Ltd.*, New Delhi, 1959.

TABLE XLIII

(Figures in '000 tons)

	Total plant nutrients in cowdung burnt as fuel	Minimum available nutrients from cowdung burnt as fuel	Planned targets from fertilizer plants at the end of 1960-61
Nitrogen	1,530	918	382
Phosphorus (P_2O_5)	850	510	120
Potash (k_2O)	1,870	1,122	30
Total	4,250	2,550	532

The value of the three 'available' plant nutrients alone lost by burning cowdung would amount to Rs. 382.5 crores each year (at an average value of Rs. 1,500 per ton of nutrient). If we give a nominal value of Re. 0.80 per ton of dry dung for its organic content, the 200 million tons of dung would have to be valued at Rs. 160 crores. The total would thus amount to Rs. 542.5 crores. On the other hand, the fuel value of the dung is equivalent to only 80 million tons of coal. In other words, the farmer who burns dung is using a fuel whose equivalent value to him as fertilizer, on a very conservative estimate, is Rs. 67.8 per ton of fuel.

For fixing 918,000 tons of nitrogen alone (see column two of the table) in the form of chemical fertilizers, a capital outlay of more than Rs. 250 crores will be required. For producing the other two plant nutrients, *i.e.*, potash and phosphorus, besides finding the capital outlay, raw materials will have to be imported.

In the last column of the table, the targets for the introduction of the three plant nutrients at the end of the second Five-Year Plan have been given. It will be seen that by burning dung we are losing nearly five times the quantity of fertilizers which we plan to produce as chemical fertilizers at an investment of more than Rs. 100 crores. If dung were solely used as manure, the net annual drain on plant nutrients—estimated earlier at 6.3 million tons—would be reduced by over 40 per cent (Pp. 22-23).

Of all kinds of dung Richard B. Gregg, a believer in Mahatma Gandhi's programme for uplift of India, places the highest value on cow-dung. He says:

Of all the various fertilisers, cow-dung is the best. Because the cow chews its cud, the organic particles are very fine. Because the cow has three stomachs, the organic matter has been not only well digested but has in it certain vitamins and other subtle elements that are missing from the dung of horses, sheep, goats, or pigs, and which enrich the soil when put on it. Cow-dung contains minerals, nitrogen, phosphorus and potassium, that are the important part of chemical fertilisers. But since it also contains the rich, finely-divided organic matter which is easily assimilated by the micro-organisms of

the soil, and which improves the physical structure and water-holding capacity of the soil, cow-dung is the best of all fertilisers.

If, instead of being used for fuel, the cow-dung could be put on the soil, preferably after composting it with waste vegetation, then the fertility of the soil would greatly increase. Thus India could come far closer to feeding herself and be that much safer from famine.[1]

Only when a cheap and plentiful supply of firewood in rural areas is available, will the farmyard manure be diverted from the village hearth to the village field. There are four fast-growing trees which bear the botanical names of *Cassuarina equisetafolia, Eucalyptus citriodora, Cassia siamea* and *Cassia arabic* (known as *babool* in Uttar Pradesh) and which would, after waiting five years for them to grow, supply the needed fuel. Village Panchayats could maintain a grove of any of these trees or each peasant might have a few trees on his holding or the boundaries of his fields. Because of its deep-rooted system *babool* does not compete with farm crops for nutrition in the upper layers of the soil and can tap the sub-soil water and, therefore, thrive on *usar* (alkaline) lands. Its feather-like leaves do not shade crops so as to reduce their yields. Both the Cassias, *viz., Cassia siamea* and *Cassia arabica,* are members of the leguminous family of trees which grow nodules on their roots and fix nitrogen. Therefore, they have an additional advantage of adding to soil fertility and rendering unculturable land culturable. The other two plants are non-leguminous. But they, too, have an advantage besides providing fuel: green shoots of *Cassuarina equisetafolia* may be used as fodder for cattle, and *Eucalyptus citriodora* can yield oil.

Cotton-stalks could make another alternative. If we can persuade every peasant, where climate does not stand in his way, to grow, at least, one-third or one-half of an acre of cotton on his farm, as he used to when the British conquered the country, and introduce or re-introduce *charkha* in every village home, it will, in addition to fuel, give employment to his women-folk, employment to the blacksmith, the carpenter, the carder, the weaver, the dyer, etc. and save money, which he would have spent on purchasing mill-made cloth from the market. Also, cotton-seeds that will be available will serve as, perhaps, the best cattle-feed, especially for the buffaloes.

We will also have to have new *choolhas* for our villagers—*choolhas* which will utilize all the heat, all the energy that is generated from the fuel. Today, much of this energy goes waste. Indeed,

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[1] Richard B. Gregg's article, *One Way to Increase Food Production,* published in the *National Herald,* dated March 23, 1958.

economy of fuel must be made a national slogan—a slogan of as big an importance as any other, just as it is in Japan.

Human excreta or night-soil is another source of organic manure. The Chinese, who are greatly manure-minded, regard—and rightly regard—night-soil as property which has to be cherished rather than as waste material which may be thrown away. Josue De Castro comments on this trait of the Chinese thus:

> The dependence of the Chinese people on human wastes is so complete that along the roads in certain remote parts of the country the traveller finds special pavilions where suggestive, poetical inscriptions invite him to rest awhile, and leave his small, personal contribution of organic matter in the receptacle provided, for the sake of the regional soil. The same traveller may be amazed as he approaches the cities to see the belts of greenery that girdle them. This wealth of vegetation is owing to the abundance of fertiliser in the cities; the sale of this material is actually one of their chief sources of income.[1]

Calculated at the rate of 11 lbs. of nitrogen which human excreta or waste expelled from the body of one person, on the average, produces in a year, 40 crores of people in the Union of India produce 2 million tons of nitrogen. This will serve to fertilise 100 million acres at 20 kgms. to an acre. But we are doing practically nothing to conserve this source of nitrogen supply. No cheap, simple and easily portable latrine has yet been evolved for the villages. In all cantonments, railway stations and factories, the night-soil is simply burnt and in many a big municipality we are burying it so deep in barren lands that it is lost to the plants for ever. In all big towns, near about the sea and rivers, we unthinkingly throw it away into the sea or river, incidentally polluting the water and making it injurious both for man and animal. A way, therefore, has to be found to utilise the night-soil, and the best way to do it is to compost it along with other waste material. If it is used in its raw form or without subjecting it to hygienic processing, it breeds diseases.

Oil-cake is an important source of concentrated hygienic nitrogen, but its supply can be expanded only slightly and the cost of manuring cereal crops with this is prohibitive.

As a source of nitrogen, green manures, however, have distinct possibilities of rapid expansion. Crops like sun-hemp which grow quickly make ideal manure. Where sun-hemp seed is not available, or as an alternative, other leguminous crops like *moong, guar* and *cowpea,* can be used. The crop has to be ploughed into the soil after the onset of the monsoon. It adds to the soil almost as much fertility per acre, as 50 to 100 maunds of cow-dung manure.

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[1] *Geography of Hunger,* p. 137.

Suitable shrubs and green manure plants can be developed to cover every field in every village in the country in two to three years from small nucleus materials. In the Madras State, confidently asserts[1] Shri M. S. Sivaraman, ICS, Adviser, Programme Administration, Planning Commission (formerly Director of Agriculture, Madras), on every holding, irrespective of its size, it is possible to produce the complete requirements of organic manure by way of composts for use on dry and garden lands and green manure for use on irrigated lands by border planting of green manure shrubs, perennial or annual—without in any way affecting the usual crops. The border planting does not require any expenditure of money and all that is required is an earnest effort to raise the shrubs on a pre-determined plan.

There are three other kinds of organic manure, *viz.*, sullage and sewage water, tank-silt, and hyacinth. There is as yet little practical experience of the former so that no firm statement can be made but remarkable effects on the improvement of soils, especially *usar* lands, and in increasing crop yields have been observed. Tank-silt was in very common use as manure some two generations ago, but not so now. Its possibilities have to be investigated. Hyacinth which infests tanks and ponds in most parts of north-western Uttar Pradesh, gradually filling them up, makes very good compost.

There is a nutritional cycle (खाद्य-चक्र) in Nature, without maintenance whereof Mother Earth will refuse to yield any crops at all. Nature has so ordained that whatever the earth produces is the nutrition (खाद्य) of all living things including man, but whatever part of this nutrition is left unutilised and, therefore, rejected by the body of man, beast, bird, or insect, is the nutrition of Mother Earth, which had, in the process of producing nutrition for the animal world, got exhausted and become hungry. If this night-soil and farm-yard waste are composted (along with dead vegetation), that is, properly treated, and returned to the earth, the nutritional cycle becomes complete, and our fields will never disappoint us and will continue giving us an ever-enduring supply of food. One really becomes tongue-bound at the wisdom of our ancestors who gave the name of खाद्य (nutrition) to the farm-yard and other organic waste that is, or should be fed to the fields regularly.

Mahatma Gandhi laid great stress on composting. The art of composting consists in collection and admixture of vegetable, animal and human wastes off the area farmed, into heaps or pits, and providing such conditions as will allow microbial action in the waste material by means of air and moisture. Compost thus prepared con-

[1] *If Each Field Grows Its Manure* by M. S. Sivaraman, ICS, Adviser, Programme Administration, Planning Commission, published in the *Pioneer* of May 20, 1958.

tains a wealth of nutrients and organisms essential for plant growth. Composting turns weeds and dead vegetation, human and animal wastes, into an asset. It improves the structure of the soil, helps soil hold more moisture, increases crop yields and improves the quality of the crops.

Writing of the secret of the successful agriculture the Chinese have practised for more than forty centuries now, Sir Albert Howard says:

> The Chinese peasant has hit on a way of supplying his fields with humus by the device of making compost. Compost is the name given to the result of any system of mixing and decaying natural wastes in a heap or a pit so as to obtain a product resembling what the forest makes on its floor: this product is then put on the fields and is rich in humus. The Chinese pay great attention to the making of their compost. Every twig, every dead leaf, every unused stalk is gathered and every bit of animal excreta and the urine, together with all the wastes of the human population, are incorporated. The device of a compost heap is clever. By treating this part of the revolution of the Wheel as a special process, separated from the details of cultivation, time is gained, for the wastes mixed in a heap and kept to the right degree of moisture decay very quickly, and successive dressings can be put on the soil, which thus is kept fed with just what it needs: there is no pause while the soil itself manufactures from the raw wastes the finished humus. On the contrary, every thing being ready and the humus being regularly renewed at frequent intervals the soil is able to feed an uninterrupted succession of plants, and it is a feature of Chinese cultivation that one crop follows another without a pause; indeed, crops usually overlap, the ripe crop being skilfully removed by hand from among the young growing plants of the succeeding planting or sowing. In short, what the Chinese farmer really does is ingeniously to extend his area. He, so to say, rolls up the floor of the forest and arranges it in a heap. The great processes of decay go on throughout that heap, spreading themselves over the whole of the internal surface of the heap, that is, over the whole of the surface implied in the juxtaposition of every piece of waste against every other. He also overcomes the smallness of the superficial area of his holding by increasing the internal surface of the pore spaces of his soil. This is what matters from the point of view of the crop—the maximum possible area on which the root hairs can collect water and food materials for the green leaf. To establish and to maintain this maximum pore space there must be abundant humus, as well as a large and active soil population.[1]

The place of humus or organic manure in the scheme of agriculture and the utility of compost in improving the soil and its yield, will be easily appreciated once we understand the fundamental truth that every form of life in nature is inter-dependent upon other forms—that new living forms draw their sustenance from dead tis-

[1] *Farming and Gardening for Health or Diseases* by Sir Albert Howard (Faber and Faber Ltd., London), pp. 46-47.

sues of older forms. Edward H. Faulkner in his *Ploughman's Folly* (pp. 15-16) quotes Paul B. Sears as saying in *Deserts on the March:*

> The face of the earth is a grave-yard, and so it has always been. To earth each living thing restores when it dies that which has been borrowed to give form and substance to its brief day in the sun. From earth, in due course, each new living being receives back again a loan of that which sustains life. What is lent by earth has been used by countless generations of plants and animals now dead and will be required by countless others in the future.

As will appear later, organic manure of any kind, particularly of the bulky kind, not only recoups the soil that may be depleted or exhausted by crops, but also helps maintain or conserve it best. Organic matter mixed into the soil surface will cause that surface to appropriate the rain as it falls, thus obviating flow of water which is essential to the processes of erosion.

It will not be out of place here to draw attention to the evils of monoculture, which are unfortunately not fully understood. Hardly any other single factor proves so ruinous to the soil fertility as monoculture, especially as being practised by the small paddy or sugarcane growers in certain eastern parts of Uttar Pradesh where holdings are small. There is no attempt to follow any crop rotation, wherein a leguminous crop would intervene. If such conditions are allowed to continue any longer, the soil would be rendered barren.

Also, while dealing with the subject of soil exhaustion, it will be advisable to re-emphasize that large agricultural machinery serves to deplete the soil, rather than to improve or conserve it, at least, in our climatic conditions. Tropical sunshine, on the one hand, kills the micro-life in the soil, on which its fertility depends, and causes more rapid oxidation of organic matter in the soil than in temperate climates. The torrential rains of the monsoons, on the other, wash away the top soil faster than the more moderate rains of European or Northern countries. If we abolish the bullock and use tractors instead, we will have to apply chemical fertilisers instead of dung or compost, which is the best form of organic matter for fertilising the soil and best means of soil conservation. Thus, with tractors taking the place of bullocks in our agricultural economy, India will soon end up with a desert. We will, therefore, do better to discourage the use of tractors and other large machinery, particularly, on lands which are already under the plough.

If better or improved seed is sown, it will certainly give improved yields. If the farm area permits a scientific or balanced crop

rotation, it will help maintain the fertility of the soil and also ensure better yields in the long run.

In most of our cultivable area, only one crop is grown during the year. Now, this is a clear waste of our land resources. Wherever facilities of irrigation and manuring—and these have to be increased—are available, no field should be left without double cropping. There are examples where farmers raise four to six crops in twelve months.

In areas of uncertain rain-fall or poor productivity, or where double-cropping is not possible, and on small holdings the cultivator can resort to mixed crops so that, in case there is drought or other calamity, one crop may survive or grow better than the other, and the fertility exhausted by one crop may be made up by the other, provided the latter is a leguminous crop. (Before the Britishers arrived on the scene and wanted only unmixed wheat to be imported to their country, our farmers used largely to sow wheat and gram mixed with one another.) Some plants are deep-rooted and draw most of their food from far below the surface, while others have spreading roots which feed close to the surface. By mixing two such crops, both can thrive without interfering with each other. Even three crops may be grown in a field at a time, *e.g.*, a crop like maize whose plant goes straight upwards, a second crop of small creepers as that of a pulse, and a third root crop in the space not required by the other two. Mixed cropping thus serves, at least, two purposes: it acts as a sort of insurance against the vicissitudes of weather, and preserves, if not increases, the fertility of the soil. The combinations to suit the differing soils and climates have to be suggested by our research workers.

Better sowing practices can also be discovered. For example, attention to better spacing has been known to increase yields appreciably.

As already noticed in sub chapter III of Chapter VI, crop diseases and pests are, to a large degree, the consequence of artificial fertilisers. If organic manures alone are applied, plants will grow and remain healthy. Yet when diseases do appear, they have to be controlled and eradicated. Amongst the scientific innovations in the field of agriculture, the plant protection measures came only second to fertilizers. Among these measures, importance of control or destruction of field rats cannot be over-estimated. There is said to be a rat population of over 2000 millions in the country causing an annual damage of over 2.6 million tons of food-grains.

Capital will also have to be found to provide pedigree live-stock and to provide new equipment to a steadily increasing degree,

for example, the simple equipment that the Italian peasant uses for dairying, rice growing, fruit growing and similar activities.

The farmer's need for credit cannot, in fact, be over-stressed. Owing to a difference in the nature of agriculture, on the one hand, and industry and commerce, on the other, there is a difference in the rate of turn-over of capital in the two groups of undertakings. The industrialist and the trader turn their capital over several times a year; the farmer, on the other hand, requires several years to turn his capital over. Industry and commerce operate daily, but agriculture has to wait for months and, in some cases, even years before it can realise a return on expenditure. The so-called economic lag in agriculture, *i.e.*, the period during which costs have to be met before the product is finally marketed and yields a return, is long in comparison with the lag in industry and commerce. This lag represents a period of expense and, therefore, a period of strain on the farmer's purse. Owing to the slow capital turn-over in agriculture, the farmer requires credit for comparatively long periods and the source of credit, therefore, that suits the industrialist and trader may and, in fact, does not suit him. The result is that the industrialist and the trader can more readily obtain financial facilities from banks, other financial institutions and investors than farmers can.

The farmer's credit problem furthermore is accentuated by the low return which he earns on his capital. The combination of the two factors—slow turnover of, and low return on capital—demands that the farmer must be assured of cheap credit for a comparatively long period. It is for these reasons that Governments all the world over have deemed it fit to take special legislative measures for agricultural financial requirements, especially, long-term and intermediate credit; or, the farmers themselves have through co-operation tried to satisfy their credit requirements. In India, however, neither the State nor the co-operative movement has come up to the people's expectations or demands of the situation.

The percentages evidenced by the table on the next page give an indication of the extent to which the main agencies of rural credit severally contribute to the total borrowings of the cultivators.

Supply of State credit in the form of *takavi* meets only 3.3 per cent of the need; the co-operatives and the banks between them 4.0 per cent. It is true that, of the needs for which credit is required, resource facilities like water, manure and seeds are the most important, and the State has constructed canals and reservoirs and sunk tube-wells as also opened stores for supply of seeds and fertilizers. The resources of the State, however, are meagre and its economic operations are often costlier and necessarily hamstrung by

TABLE XLIV

Credit Agency	Proportion of borrowings from each agency to the total borrowings of cultivators per cent
1. Government	3.3
2. Co-operatives	3.1
3. Commercial Banks	0.9
4. Relatives	14.2
5. Landlords	1.5
6. Agriculturist Moneylenders	24.9
7. Professional Moneylenders	44.8
8. Traders & Commission Agents	5.5
9. Others	1.8

Source—Summary of the Report of All-India Rural Credit Survey, (1955), Vol. II, p. 5.

rules and regulations. State aid in all these spheres, therefore, will have to be supplemented to a far greater extent by co-operative action on the part of the peasant farmers themselves.

It will be a mistake to believe that co-operation does not suit the genius or mental attitudes of our people. It is only when a peasant is convinced that co-operation, which, in fact, is merely so called, is another name for merger and would deprive him of his individual rights in property that it becomes abhorrent to him. A village, as our long history bears out, was always a stronger moral unit than a factory is. The sense of the community was a vital thing among the peasantry, providing a natural foundation for collaboration or co-operative action. So, in spite of agriculture being the most individualistic industry, the peasant in old India, as in some other countries has inherited and kept up certain co-operative instincts and traditions of neighbourly collaboration. Helping each other, whether it was a matter of ploughing, bringing in the harvest, building a house or even preparing a girl's dowry 'chest', was a matter of course, a tradition, not an organised arrangement. The cost and responsibility of sugar-cane pressing, well or tank irrigation, provision for drinking water, drainage, cultural centres, fairs, etc., have been shared in common from time immemorial. Culti-

vation of crops according to a pre-arranged plan and their protection from boars and other wild animals are still common features of some of our villages. Neighbourly collaboration has taken various other forms also: such as lending each other a bullock or a pair of bullocks; exchanging a day of work for other services, etc. Within a better and consciously-planned organisation, this mutual co-operation or collaboration might be still further extended and developed.

Differences or disputes amongst the villagers were settled mostly by discussion on a basis of equity guided by the village elders, the priest or the teacher, again, as a tradition and out of the self-same sense of being one community: hardly, if ever, was a matter put to vote. People versed in political economics make much of decisions by majority vote. The ancient Indian village offers a possibly higher alternative, if we believe in Government by consent, in decisions by the general sense of the community. This procedure left no sense of bitterness in the defeated party and no sense of elation in the victorious. In fact, there was no victor and no vanquished. If we want to make our village panchayats a success, the present system of decisions by majority vote will have to be greatly modified, if not abandoned altogether.

To revert to agricultural co-operatives: they can be made to serve every need and every aspect of rural life. They may, in particular, engage in one or more of the following functions:—

(i) receiving deposits and making loans for reasonable business and personal requirements,
(ii) improving agricultural lands and water facilities,
(iii) processing, storing and transporting goods produced by its members,
(iv) making available rural industrial facilities,
(v) insuring property of its members against damage or loss and reducing other uncertainties confronting farmers,
(vi) making available those common services which will improve the social and living conditions, culture and health of the agricultural community,
(vii) conducting educational activities relating to co-operative associations and farming techniques,
(viii) organising collective labour, or *shramdan* to meet collective needs like building a road in one place and irrigation channel, or improving drainage elsewhere,
(ix) improving marketing facilities, that is, facilities for purchase of requirements (including improved seeds, improved agricultural implements or, if necessary, even machines, cattle-feeds, scientific manures or fertilizers, if they at all need them, insecticides and domestic supplies like cloth, oil, salt, matches, soap, etc.) and sale of produce.

It is in the improvement of marketing facilities—according to Adam Smith, "the greatest of all agricultural improvements—that a

co-operative society offers its members the technical advantages of a large-scale undertaking in the largest measure."

Although the small farmer labours under various disadvantages, yet experience has shown these to be commercial more than technical. He can hold his own in the field of production. It is when he enters the market that he finds it difficult to stand up to the big man. The profit that he might have gained in production is often lost in the selling. His disadvantage arises from his weak bargaining power which is fully exploited by the middleman. In the marketing of every agricultural commodity the spread between the price paid to the grower and that paid by the final consumer is very wide to the injury of the grower, and one of the fruitful methods of enhancing the income of the grower is to rationalise the distributive trade by eliminating some, at least, of the swarm of intermediaries who render no other service except to give a push to the commodity. Co-operative marketing strengthens the economic position of an individual grower and enables him "to save time for other duties, to enjoy a wider market, to sell a properly-graded product and thereby gain the benefit of a better price, to obtain the necessary financial facilities which will enable him to spread his sales over a period of 12 months instead of disposing of his products immediately after harvest and, finally, therefore, to enjoy a wider market also in respect of time".[1]

Co-operation is primarily the small man's instrument. It has been attended with special success among the small farmers of the densely-populated countries of Europe.

What is advocated in these pages is a co-operative society as distinct from the liberal Capitalist society as from a Collectivist society of Communism—a co-operative society where small men combine amongst themselves and, on the basis of their pooled resources, find the resource facilities which the big man is able to do on the basis of his capital—where all exploiters and middle-men are eliminated, where, exploitation is ended, the individuals remain free and their personalities are not merged unidentifiably in a whole.

The distinguished European thinker, Count Coundenhove-Kalergi in his *Totalitarian State Against Man*, has suggested the establishment of agricultural co-operatives as a final and lasting solution of all the ills of this war-weary world. Discussing the need for an economic revolution, he observes:

> It demands a free economic system and operation. Its aim is the creation of the greatest possible number of *independent existences* bound together by the principle of co-operation. It rejects both economic anarchy and collectivism. Its model is to be found in the

[1] *Economics of Agriculture* (1937), A. P. Van Der Post, p. 399.

> agricultural co-operatives, which combine all the advantages of private property with the spirit of brotherhood and reciprocal aid; they differ as much from the collectivist factory management of the Soviet *Kolhoz* as they do from the anarchic misery of small isolated peasants without machinery and co-operation (p. 192).

That is, it is farmers' co-operatives, where the identity both of the farm and the farmer will remain unimpaired, that are needed, not co-operative farms.

Along with co-operative financing and marketing, an adequate and dependable transportation system is equally important, since without it land cannot always be put to its most advantageous use. To illustrate: it is not profitable for peasant farmers living in far away villages to grow fruits or vegetables if they cannot market their products as soon as they are produced. Also, largely for the same reason, *viz.*, want of cheap transportation facilities mountainsides of the Himalayas in North India are being shorn of their forests for farming purposes. The fruits and the timber grown in these parts are worth little because of high transportation costs. Moreover, food-stuffs cannot be brought in for the same reason; yet food must be had at any cost and that cost is the erosion of mountainsides wrongly used for farming and the filling of stream channels, resulting in the flooding of productive lands in the Indo-Gangetic plains.

CHAPTER XXI

SOIL CONSERVATION

The last chapter was concerned with one of the two highly important objectives in agriculture, *viz.*, improved crop yields, which is immediate. This chapter deals with the second objective *viz.*, prevention of erosion, which is long range, but closely related to our ultimate welfare.

Any nation's soil resources constitute its greatest wealth, rather the very basis of its existence. "In reality all life on the land—vegetation, trees, insects, animals and human beings—depends on the existence and healthy condition of only about eight inches of top-soil, the part that contains the soil bacteria, fungi, other microscopic forms of life, and earth worms."[1] Failure to realise the need of soil maintenance has led many a people to ruin and convert many a prosperous country into a howling desert.

As pointed out by Jacks and Whyte in Chapter VIII of their work, *The Rape of the Earth,* there are two kinds of erosion—'vertical' and 'lateral'. The former involves the washing out of the soluble parts of the soil and the latter mainly the washing (or blowing) away of the insoluble parts. 'Vertical' erosion is always liable to occur in humid regions where the movement of water in the soil is predominantly downwards but not in arid regions where water is drawn upwards by evaporation. 'Lateral' erosion is very liable to occur on unprotected soils in arid regions because the soil pulverizes and loses its water-absorbing power when it dries out. Both 'vertical' and 'lateral' erosion occur in the humid tropics owing to the effects of extreme heat and torrential rain.

Perhaps, there is nothing which a man can do to prevent completely the leaching of soluble plant nutrients, salts and minerals, from the soil through natural action of water. Yet its ill-effects can be minimised by adding to the humus of the soil through application of heavy doses of bulky organic manure like farm-yard waste and by adopting a regular system of green manuring.

It is, however, lateral erosion which is the most important cause of soil loss. Man has so misused the land that the surface soil, an inch or two of which takes centuries to build, is washed away by water in one rainy season or blown away by wind in one summer. Land is uneven and hence subject to washing where rain-

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[1] *Which Way Lies Hope?* (1957), p. 7.

fall is heavy and water flows rapidly. In dry areas the soil blows away. These natural phenomena combined with the misuse of land by man, which consists mainly in overcutting, over-grazing and over-ploughing, can cause rapid soil losses. In India these losses are likely to be great, for she has a tropical climate with a combination, over much of its area, of strong sunshine and alternating torrential rains and drought. The ill effects of this sort of climate already noticed, are heightened after the natural covering of the soil has been removed through its misuse by man. With this covering once removed, nature in the form of wind and water rushes to take its toll.

Wind erosion is specially prominent in tracts covered by soils of single-grained structure. Next to disappearance of vegetation it is lowering of the sub-soil water table that is responsible for wind erosion. Lowering of the water table results in intense desiccation and consequent loss in soil aggregation, i.e., soil texture and humus content. The prevention of this form of erosion has to be sought mostly in improving the structure of the soil through accumulation of humus. Wind erosion on cultivator's land can, therefore, be controlled, again, by adding organic material to the soil through green manuring or application of compost in liberal quantities. Adequate provision of irrigation facilities would undoubtedly be a great help. Denudation of vegetation can be made good, for example, by cultivation of crops like sugar-cane. A shelter belt of trees can also be raised at suitable sites.

Erosion through water takes three forms *viz.*, sheet erosion, rill and gully erosion (culminating in ravine formations) and flood erosion. Several times more plant food is carried away from farm land in the streams that drain the various water sheds than is absorbed by growing crops or grazed off by animals. Water erosion has gone on throughout the ages, but it has been greatly accelerated in recent years, particularly, in North India, owing to heavy rains. Sheet erosion is the most wide-spread and yet continues un-noticed. It cuts into the very vitals of the soil through removal of the surface layer and thus, in the course of years, renders the soil, in an insidious manner, totally unfit for agricultural purposes. Constant vigilance is, therefore, needed to prevent the ravages of sheet erosion. For its prevention and control, it is imperative that no piece of land in rainy season, cultivable or otherwise, is left without vegetation and without proper *mends* or embankments on contour lines, and that ploughing and sowing in adjoining sloping areas, if any, and where the slope is only moderate, say, 2-3 per cent, is done not parallel to the slope but across it. This will reduce the run-off

and enable the water to be absorbed into the soil. As far as possible, quick-maturing legumes, for example, *moong, lobia* and ground-nut, or other cover crops which grow thick and close to the ground, sown in the rainy season, can effectively reduce sheet erosion to the minimum. Such crops will also serve as green manure. Strip cropping with legumes is also useful where the slope is moderate.

The ravages of gully erosion are, indeed, very conspicuous. This form of erosion, to which sheet erosion, if unchecked, gradually leads, can only be prevented by starting operations right at the point of origin, or the head, by adopting widespread afforestation, controlling grazing and putting a ban on arable cultivation. The steps for checking gully erosion in the lower reaches may be of a large magnitude, totally beyond the resources of the average individual cultivator, inasmuch as they would involve erection of dams, or construction of terraces, or gully-plugging, or adoption of agricultural and mechanical methods for reducing run-off. In these conditions it is for the State to come to the aid of the people. Co-operative efforts on the part of farmers can also yield some results.

The ravined lands generally may be beyond redemption, but at the head of ravines there are sub-marginal lands which are under the full grip of active erosion. And above these lands lie the flat, productive fields. Adequate protective measures have to be taken and improved farming practices adopted to save the sub-marginal lands from becoming ravined lands, and productive fields from becoming sub-marginal. Control of grazing may be one of the most effective means of preventing further deterioration of ravined lands, and terraces, furrows, etc., of stopping the advancement of ravines, but suitable crop rotation, maintenance of fertility and good farming practices in general are equally, if not more important in checking the spread of gully erosion.

As regards floods, afforestation, particularly, in the upper reaches of the rivers is most efficacious. Devegetation and denudation of the soil is the fundamental reason for the fury of the great North Indian rivers which, feeling their marginal lands shorn of trees, begin to swallow up the loose and unprotected soil of the plains and to take revenge by over-flowing their banks. Just as the loss of the forest cover is singly the most potent cause of soil erosion and has brought increasingly destructive floods, so tree plantation is singly the most potent method that will prevent floods and conserve the soil resources (as also the water resources), since no storer of water has ever been invented that is more efficient than deep, porous soil—soil which has been rendered porous and thus made a vast sponge by tree roots and vegetation. This sponge will soak up and trap the rain-drops upstream where they fell, thus

minimising down-stream, flood conditions. Bunds, except of minor dimensions and at a few strategic places, are at best a palliative, which may, in course of time, prove worse than the disease they are designed to control. Nor will it be practicable to construct reservoirs of such dimensions and in such numbers on all rivers as to divert flood waters in the required volume.

The destruction of forests is responsible not only for erosion and floods: it cuts down the reserves of humidity in the soil and leads to drought conditions. According to some authorities, trees attract rain and where there are no trees, there is no rain and, therefore, no sub-soil water. There are others who do not agree with this view. But it is admitted on all hands that where there is paucity of trees, rain comes in a heavy downpour, and flows away rapidly without being absorbed in the soil. Where trees are in plentiful numbers or take the form of a forest, it rains in mild showers. And when it rains in mild showers and there are trees and deep-rooted grasses on the earth below, water is led into natural underground reserves, recharging springs and wells. Decaying leaves and spreading root systems of trees make the soil an ideal store-house of sub-soil water to feed perennial springs.

Like the nutritional cycle, there is another cycle in Nature, *viz.*, the hydrologic (जल-चक्र)—the movement of water from the air to the land and eventually back to the air, usually by evaporation from the lakes, rivers and oceans—which man can help maintain by planting trees, and has to be explained to every child in the country. It was not without reason that our *Rishis* taught that tree means water and water means life, and our unsophisticated villagers have been handing down a saying from father to son that it is a sinful act to cut down a green, living tree, while it is a virtuous act to plant one.

Apart from providing shade and fuel and conserving soil and water resources, trees can and do greatly contribute to food production. Fruits which trees alone can supply are such a necessary complement of balanced diet. Trees also provide shelter against desiccating winds which affect crops so adversely. In fact, the maintenance of a good forest cover is essential to agriculture—to the duration and prosperity of every nation, culture or civilization. As John Stewart Collis wrote: "Trees hold up the mountains. They cushion up the rain storms. They discipline the rivers. They maintain the springs. They foster the birds."[1] It may be added the forest also conditions the weather and equalises the climate. Trees, therefore, have to be planted and forests allowed to grow

[1] *In the Triumph of the Tree*, p. 149, quoted by Richard B. Gregg in *Which Way Lies Hope?*, Navjivan Press, Ahmedabad, 1957, p. 35.

once again where they had been cut from, by human greed and folly.

Van Mahotsava is one of the few movements launched since the attainment of Independence that have gone to the root of a problem and had a psychological appeal, but it would seem to be slogging; it is in danger of becoming a formal ritual and stands in need of rejuvenation. If groves to be planted in future are exempted from payment of land revenue, agricultural income tax and irrigation charges, it will give a fillip to the movement.

If we have one thing to learn from Japan, it is her care of forests. "In order to obtain high yields", says Josue De Castro,[1] "Japan put into practice all the agricultural techniques she could learn from the West, and adapted them to the traditional processes of Chinese and Japanese farming. But though these people have always been under pressure to produce more food, they have never robbed and abused their soil, or worked it out in a few years as has been done in various parts of the Occident. In spite of the tremendous pressure of population, great tracts of land have been set aside as insurance against erosion. Foreign specialists have always wondered why Japan, with her shortage of food, particularly of proteins, never took up cattle raising. It could have been done just as well there as in New Zealand, where the topography is very similar to that of the Japanese Islands, by taking the same advantage of mountainous lands unsuitable for agriculture. The reason lies in Japan's wise policy of soil conservation, a technique that this country was the first in the world to adopt. Once the forests had been sacrificed to pasture, waters pouring off the slopes with nothing to stop them might well have done tremendous damage to the soil of agricultural areas." For this reason Japan still has a forest reserve of 5.2 million acres, an area which is 40 per cent of that given over to cultivation.

We should also, all clamour notwithstanding, take a definite decision in long-term national interest that no forests shall in future be cut down simply to extend cultivation or settle landless people. Our food problem will have to be solved almost entirely by intensive cultivation, rather than by bringing valuable forest land or marginal and sub-marginal land under cultivation.

Then, there is the question of uneconomic cattle, particularly the cows and goats, which are a great strain on the soil resources of the country. Uneconomic cattle impose a heavy cost not only in terms of deprivation of land from utilization for human food, but also in terms of soil erosion. No single factor is as much responsible for

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[1] *Geography of Hunger*, Josue De Castro, London, 1952, p. 164.

wide-spread erosion of all kinds as indiscriminate and uncontrolled grazing. By their excessive grazing these cattle destroy young trees, shrubbery and grass so much as to strip the plains and hillsides clean of vegetation. That invites erosion in the rainy season, causes floods and extends the deserts. If, therefore, erosion has to be checked, grazing will have to be controlled, and grazing is difficult, if not impossible, to effectively control unless measures are instituted to greatly reduce the number of uneconomic cattle and to prevent them from multiplying.

Cow has given us traction power in the form of bullocks and will continue to give it; it has given us sustenance for land in the form of dung and sustenance for man in the form of milk and will continue to do so. It is the base of our agricultural economy and our health. Our civilization, in fact, our very existence depends on agriculture. Cow, therefore, is rightly regarded as almost a member of the peasant's family and has rightly occupied a high place in our legend, in our folk-lore, in our history, in our sentiment. At the same time, its breed today has deteriorated greatly, the main reason being that most village pastures are pastures only in name, and serve mainly as an exercise ground for cattle and year by year the soil is eroded away until the land becomes a dreary waste. More and more animals are kept and there is less and less for them to eat. It is small wonder then that the village cows are poor, thriftless beasts with a phenomenally low milk yield. In 1951 the average milk production of Indian cows was not over 1.5 pounds per day, where this average in the USA was about ten times greater. Even a good cow cannot compete with the buffalo, at least, in the production of ghee or fat which is the measure of money income that a milch-animal brings. So, as soon as its maintenance begins to cost more than what it yields, the peasant sells it to the butcher, or a middle man, knowing all the while that he is sending it to the hack. This outrages the feelings of the Hindu community. So somewhere a compromise has to be made; a principle has to be found which will strain neither the heart of the Hindu nor the economy of the country. The best solution would seem to lie in segregating or sterilizing all uneconomic cows, so that they might not be instrumental in multiplying a useless breed, and simultaneously in upgrading the sires—the bulls. Sterilization of the young male or a scrub bull does not require castration. A slight operation does it, by tying the spermatic cord, involving but very slight and brief pain.

The day the cow ceases to be an object of utility altogether, it will disappear completely, sentiment notwithstanding. Since the horse went out of use as a result of mechanisation of the army and

other transport after the first World War, it has become rare in the country, without having been butchered or eaten up by anybody. On the other hand, according to the cattle censuses of Uttar Pradesh, the she-buffalo has, during the last 50 years, multiplied in numbers as compared with the cow, inspite of the fact that proportionately more buffaloes have gone to the shambles during this period than cows. This is all because the housewife attaches, and rightly, more value to the buffalo than to the cow.

The following statement[1] shows the number of cows and buffaloes slaughtered in the recognized slaughter houses of Uttar Pradesh since 1936-37, for which period alone the figures are available—

TABLE XLV

Year		Cows	Buffaloes
1936–37	...	1,26,828	1,12,030
1937–38	...	1,42,237	1,21,817
1938–39	..	1,18,690	1,27,914
1939-40	...	1,35,379	1,54,198
1940–41	...	1,26,331	1,80,891
1941–42	...	1,25,470	2,42,229
1942–43	...	1,17,207	2,05,148
1943–44	...	76,543	1,72,763
1944–45	...	59,283	1,60,881
1945–46	...	75,345	1,82,493
1946–47	...	81,544	1,80,737
1947–48	...	49,908	27,434
1948–49	...	19,024	1,70,774
1949–50	...	27,839	2,02,196
1950–51	...	5,086	2,32,962

In spite of a total of 25,74,000 buffaloes having been slaughtered during these 15 years as against a total of 12,87,000 cows only, the number of the former increased from 34,21,000 in 1904 to 49, 88,000 in 1951, while that of the cow decreased from 69,48,000 to 61,20,000 during the same period. The cattle census of 1956 shows the same trend: the number of the cows came down to 57,84,000 while that of buffaloes went up to 51,87,000. While during 1951-55 not more than 15,000 cows had been slaughtered as against 8,98,000 buffaloes.

Next, there is the goat. Of all cattle, it is the one which eats away grass and foliage far closer to the ground—rather tears them away from the very roots. It eats many shrubs, the lower branches

[1] Report of the Gosamvardhan Enquiry Committee, Uttar Pradesh, 1954, Part II (Appendices), p. 99.

of trees and young seedling trees entire. Just as a swarm of locusts eats up everything it comes across, so a herd of goats can, in course of time, devastate a blooming country-side and convert it into a veritable desert. The goat has, therefore, to be actively discouraged, particularly, in Rajasthan and the adjoining areas. It renders no peculiar service to the people, except as a source of milk supply to the poor man and one of the sources of meat-supply to the non-vegetarian section of our people. There are, however, other sources of milk supply, and the non-vegetarians can do with a little less or dearer meat.

Further, although the goat does not feed on cultivated fields, it will not be a calamity if the meat supply otherwise also diminishes, or we, as a nation, turn still more and more to a vegetarian diet. Other arguments apart, our land-man ratio would strongly tend to dictate such a course. There is not sufficient land left in India today for growing food to feed animals to be slaughtered for human consumption. Domestic animals raised for food required several times more land than was necessary to raise an equivalent amount of nutrition in the form of grains, fruits and vegetables for human consumption. Thus India already on a predominantly vegetarian diet, would seem to be living far more wisely within its own land resources than are the meat-eating peoples. Referring to the German Four-year Plan prepared by the Nazis, an eminent economist, G.D.H. Cole, writes—

> The virtually official institute for Konjuncturforschung has recently issued an elaborate memorandum telling the citizens what types of food they may consume, and what they are to avoid, in the interests of the nation. In this highly instructive document, the first emphasis is laid on reduced consumption of all products of animal origin, with the exception of fish and rabbits. Each hectare of soil, it is pointed out, can be made to yield a far larger food value if it is used to produce vegetable products than if animals are fed upon it. One hectare under potatoes, it is calculated, gives twenty times as great a value as one used for producing beef; and one hectare under wheat is nearly ten times as productive in this sense. Accordingly, the German people is adjured to 'change over to a diet which prefers plant products, such as, potatoes, vegetables and sugar, rather than animal products'.[1]

Teachings of our ancestors in regard to vegetarianism, which, *inter alia*, had their roots in the basic economic facts of our soil and climate, find confirmation in the eating habits of another ancient people, the Chinese. The author of *Geography of Hunger* says—

> Vegetable foods are so predominant in the diet of the Chinese people that only 2 or 3 per cent of the total calories are of animal origin, compared to 39 per cent in the United States. The Chinese

[1] Vide *Practical Economics*, England, 1937, p. 111.

> cannot afford to waste his limited soil in the raising of animals, and he knows it; animals yield much less nutritional energy per acre than do plants. The Chinese knows that a vegetable eaten directly by man furnishes infinitely more energy than the same product indirectly utilized in raising livestock. Unfortunately, the task of obtaining enough energy for his basic, vital functions has always been the immediate and burning problem with him. By giving himself almost entirely to agriculture, and planting only high-energy foods such as rice, wheat and millet, the Chinese farmer still falls short of a ration of 2,250 calories daily. Where would he be if he indulged in the luxury of converting vegetable calories into animal calories? In this conversion, the scientists have found, a very small part of the energy consumed by the animal is recovered. Fifteen per cent is recovered in producing milk, 7 per cent in eggs and only 4 per cent in beef. This is the biological determinism which keeps the Chinese from raising animals to eat. In the United States 90 per cent of the domestic animals are raised for food; in China, only 25 per cent. Most of them serve merely to assist man in growing plants.[1]

According to Dr. M. R. Raghvendra Rao[2] of the National Chemical Laboratory, Poona, the efficiency of conversion of vegetable protein from cattle-feed like straw, bran, grains and oil-seed cakes into animal proteins is as follows—

Milk	40–50%
Eggs	25–30%
Meat	10–15%

It is clear that a given area of land in the form of corn and other vegetable materials will support about eight times as many men as will the meat obtainable from the same land. Densely-populated areas, therefore, like India, China, Japan and Indonesia can ill afford a meat diet, at least, on the western scale. According to Mr. Richard St. Barbe Baker, a forester and ecologist, world tension, which arises mostly from uneven distribution of land, could be relieved "if we all could accept a vegetarian way of life."

There are, however, two or three categories of animals which can be added to our menu without detriment to national interest, for example, birds of the air, terrestrial animals like rabbits and deers, and aquatic animal like fish, which do not compete with men for food space, and are available—particularly of the last category —in practically inexhaustible numbers. We have a coastline of about 4,000 miles and a continental shelf more than one lakh square

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[1] *Ibid.*, pp. 126-27.

[2] An article published in the magazine section of the *Pioneer*, Lucknow, dated June 1, 1958.

miles. But we are today exploiting barely 6 per cent. of our fishable marine and not more than the same percentage of our water resources.

Lastly, there are the monkey and the blue-bull to be considered. They are nothing but pests and have undoubtedly to go. Respect for life inculcated by our ancestors has its limitations. Our agricultural economy has reached a stage where it cannot bear unnecessary burdens—where we will have to make a definite choice whether it is the man or animal that we want to see survive. Both the monkey and the blue-bull do incalculable harm to standing crops and have nothing to recommend in their favour, except superstition.

So much for conservation of soil resources, that are already under utilization of some sort, by promotion of proper agricultural practices, contour ploughing, terraces, strip cultivation, composting, use of night-soil, crop rotations, planting of fast-growing trees for fuel wood, restriction on grazing, etc. etc. But there are millions of acres which are utterly barren and make no contribution to the wealth or welfare of the nation. For example, there are water-logged, *usar* and weed-infested areas which can be utilized, provided there is the imagination and the will to do so.

Water-logging is deleterious to the growth and the ultimate yields of crops. It also raises the spring-level, which is generally very injurious to the soil. In regions of low rainfall it is the nearness of the water-table to the surface of the soil that has mainly been responsible for the occurrence of large *usar* tracts. Drainage, therefore, should receive our earnest attention. The most obvious means by which good drainage facilities could be afforded at a cheap cost and through co-operative efforts is to desilt and deepen the *nalas* (channels), which abound in large numbers, so that these could be used both for irrigating the land and for draining away surplus water. Natural drainage of our country-side has been greatly upset by the faulty alignment of roads, canals and railways, and faulty construction of culverts, bridges and aqueducts. Where necessary, these have to be re-examined and improved.

In the absence of adequate drainage facilities the water-table in certain irrigated areas commanded by canals, has been gradually rising in the recent years. Large areas which used to be good arable land some 20 or 30 years back have now become almost swamps or *usar*. There is a provision in the Canal Drainage Act, 1873, that for every three miles of the canal there should be two miles of drainage cuts. But in actual practice, even where this scale is rigidly followed, the drainage cuts are allowed to silt up, with the result that due to lack of drainage or to defective drainage the water table is gradually coming nearer the surface of the soil. The absence of

silt berms along the sides of the canal beds is also responsible for seepage of water in the canal-commanded areas.

The country certainly stands in need of better and greater irrigation facilities. And yet we cannot ignore the fact that there are certain regions where any sudden and marked increase in irrigation may well prove detrimental to soil formation and soil fertility. In such tracts, *e.g.*, in certain parts of Uttar Pradesh where the natural topography does not permit of satisfactory drainage and where the spring-level happens to be rather high, care must be taken to ensure that no water-logging is ultimately produced as a result of increased irrigation.

There are large patches of *usar* or alkali land in the country. In addition to such patches or tracts as occur naturally, a number are in course of formation as the result of errors in soil management.

There are two types of *Usar*—mild and refractory. Mild *usar* formations are brought about by the accumulation of injurious salts in the surface layer through the nearness of the spring level to the soil surface. As has been stated above, prevention of waterlogging and implementation of satisfactory drainage facilities would go a long way in preventing the formation of such *usar* lands. As for amelioration of existing mild *usar* soils: Setting up of bunds all round and intermittent impounding of water and its drainage, followed by a crop of *sanai*, or preferably, *dhaincha* for green manuring, would prove very useful. For this purpose it would, however, be necessary to have a fairly large supply of water at a cheap price. After the soil has been so reclaimed, care should be taken to see that a judicious crop rotation, suited to the locality, is practised and the land is never left without a crop.

Refractory *usar* formations can be attributed to the replacement of calcium of the clay-complex by sodium through various causes which have been in operation over very many years. Reclamation of such *usar* lands is a very expensive and tedious project, yet it does not mean that they should be left alone and no efforts made to utilise them in a profitable manner. The best use that we can make of these *usar* areas is to implement a scheme of afforestation by planting alkali-loving trees like *babool* (*cassia arabica*), *dhak* etc. As has already been noticed, we need badly both firewood for use in the villages, especially with a view to releasing cattle dung for manurial purposes, and grazing-ground for our large cattle population. Both of these objectives could be achieved with a large measure of success by making use of the available areas of refractory *usar* lands for afforestation and pasture purposes.

The problem of perennial weeds has been baffling the ingenuity of agricultural experts in India and many other countries. And yet

no successful programme of agricultural improvement will be complete unless and until perennial weeds of the worst kinds have been successfully eradicated. In Uttar Pradesh a large-scale campaign was in the recent past organised for eradication of *kans* in Bundelkhand by deep ploughing with tractors. This certainly resulted in a measure of success, but proved much too expensive and cumbersome to the average cultivator. Also, the weeds in certain parts have come up again. Chemical weedicides have now been tried as an experimental measure in some parts of the country, but neither the effectiveness of those chemicals has been generally established nor is this process found to be economical. By and large, therefore, one has to fall back upon the age-old system of smothering the weeds through cultivation of such crops as have luxuriant growth, *e.g. juar, guar, dhaincha* or *sanai.* Cover crops like *lobia,* groundnut and soya bean are also helpful to a certain extent. In most cases, such a system of cropping will serve the dual purpose of putting down the troublesome weeds and adding appreciably to the fertility status of the soil.

CHAPTER XXII

NEED OF POPULATION CONTROL

Until 1947, it was the political problem that captured our attention most, but, freedom having been won, the focus of attention has now shifted from politics to economics. The Census Report of 1951, in particular, has brought to the fore the demographic problem—the problem which our huge, increasing population poses and the bearing which it has on our economic conditions. The following table[1] would indicate its dimensions:—

TABLE XLVI

Year	Population* (In Million)	Variation (In Million)	Percentage variation	Mean Decennial** Growth rate
1891 ...	238.4	.....	.....	.....
1901 ...	238.4	.....	.....	.....
1911 ...	252.2	(+) 13.8	(+) 5.75	5.6
1921 ...	251.4	(—) 0.8	(—) 0.32	(—) 0.32
1931 ...	279.1	(+) 27.7	(+) 11.02	10.4
1941 ...	316.8	(+) 37.7	(+) 13.51	12.7
1951 ...	361.3	(+) 44.5	(+) 14.05	13.1

* Indian Union (including Jammu & Kashmir).
** The rate is expressed as percentage of the mean population of the period during which the growth occurred.

If the average rates for two thirty-year periods are considered, population grew from 1891 to 1920 at the mean rate of 1.7 per cent per decade, while from 1921 to 1950 it grew at the mean rate of 12.0 per cent per decade. The reasons for this difference lie in the fact that of the three factors which, according to Malthus, are the main positive checks to population growth, only one had been completely removed at the beginning of the first period. War and banditry had been eliminated owing to the establishment of a firm and ordered political system. But the other two, disease and famine, had their full sway during the period: famine in several parts of the country

[1] Census of India, Part I-A, p. 181.

occurred in 1891-92, 1895, 1896-97 and 1899; bubonic plague which had made its first appearance in modern times in India in 1896 could not be controlled till the end of the next decade, 1901-10; and the influenza epidemic of 1918 was specially severe in its ferocity. On the other hand, owing to introduction of modern public health services (however unsatisfactory and inadequate these may be, compared to other countries) resulting in the control of epidemics, and improvement of transport and communication facilities, both inside the country and outside, resulting in control of scarcity and famine conditions, which were usually local affairs and a consequence of isolation, the second thirty-year period, 1921-50, except for the Bengal catastrophe of 1943-44, was singularly free from visitations of large-scale disease or famine.

Apart from emigration, it is the difference between the birth rate and the death rate in a particular country that governs the growth of its population. Although the birth rate which, compared to other countries, is high, indeed, has shown a slight tendency to decline since 1921, yet it is the relatively far steep decline in the death rate, or the increasing difference between the two rates, that is primarily responsible for the rapid growth of our population. This would be clear from the average decade rates as follows:—

TABLE XLVII

Average Annual Rates per 1,000 *Population**

Decade	Births	Deaths	Natural Increase
1881–1890 ...	48.9	41.3	7.6
1891–1900 ...	45.8	44.4	1.4
1901–1910 ...	49.2	42.6	6.6
1911–1920 ...	48.1	47.2	0.9
1921–1930 ...	46.4	36.3	10.1
1931–1940 ...	45.2	31.2	14.0
1941–1950 ...	40.0	27.0	13.0

* Except for figures for 1941-50 which have been taken from the Census Report of 1951, all the figures have been taken from Kingsley Davis's *Population of India and Pakistan* (1951), p. 85.

One should not, however, jump to the conclusion that the rate of population increase in India is higher than in any other modern

country. Although the annual rate of increase today—nearly 1.3 per cent—is about the same as that of the world as a whole, it has been eclipsed by many nations in recent times. Kingsley Davis says: "It can be stated with some confidence that from 1871 to 1940 the average rate of increase of India's population was approximately 0.60 per cent per year. This was slightly less than the estimated rate for the whole world (0.69) from 1850 to 1940. India's modern growth, therefore, is not exceptional either way, but close to average. It is, however, less than that found in Europe, in North America, and in a good many particular countries" (pp. 26-27).

The total Indian increase during 1871-1940 was 52 per cent. The British Isles, despite heavy emigration, during the same period increased 57 per cent, and during the 70-year period from 1821 to 1890 they increased 79 per cent. Similarly, Japan, during the 70 years from 1871 to 1940, experienced a growth of approximately 120 per cent, and the United States a growth of 230 per cent. During the decade 1921-30, the United States population increased 16 per cent—a rate never yet equalled in India. The following table extracted from the United Nations' Demographic Yearbook, 1955, and Statistical Yearbook, 1956, gives the growth rate for some of these countries during two quinquennia, 1946-50 and 1951-55:

TABLE XLVIII

Annual Growth Rates per 1,000 *Population*

Country	1946–50	1951–55
USA	14.2	15.2
Canada	17.3	19.6
Australia	13.6	13.7
New Zealand	17.1	16.6
Netherlands	18.0	14.4
Japan	17.6	13.2
Union of South Africa (Whites) ...	17.6	16.9

The popular notion, therefore, that the rate of population growth in India has been faster than in most modern countries—a notion derived, first, from our high birth-rate and, second, from the massiveness, density, and poverty of the population—is obviously unwarranted.

Our birth-rate is, indeed, high. As will be clear from the following table, it is matched only by the birth-rate of Egypt and Mexico, and is greater than that of most countries—

TABLE XLIX

Crude Birth and Death Rates per 1,000

Country	Birth Rate		Death Rate	
	1946–50	1951–55	1946–50	1951–55
USA	24.1	24.5	9.9	9.5
Canada	27.6	28.1	9.3	8.5
Mexico	44.6	45.2	17.2	14.9
Australia	23.4	22.9	9.8	9.2
New Zealand	26.7	25.8	9.6	9.2
Netherlands	23.9	21.9	7.9	7.5
UK	18.3	15.7	11.8	11.7
Sweden	18.2	15.2	10.2	9.6
Denmark	20.7	17.6	9.3	8.9
Switzerland	19.0	17.1	10.9	10.1
Ireland	22.2	21.3	13.3	12.5
Western Germany ...	16.5	15.7	10.9	11.3
France	21.5	19.1	13.1	12.7
Finland	26.8	22.1	11.2	9.5
Austria	16.8	15.0	12.8	12.2
Italy	21.4	18.1	10.9	9.8
Egypt	42.7	44.8 (1951)	21.3	.....
Union of South Africa ...	26.3	25.7(1951-54)	8.7	8.7(1951-54)
Japan	30.9	22.0	13.3	8.8

Source :—Demographic Yearbook, 1955 and Statistical Yearbook, 1956 UNO

We breed profusely and die profusely. The social and economic wastage these high rates involve, has already been referred to in a previous chapter.

Granting that the annual rate of increase is the same as it was in the last decennium, 1941-50, it makes an addition of 5 million people a year, which is a matter of concern. The annual rate of increase is operating on such a huge total, *viz.*, about 400 million to-day, that the absolute net increase it produces, is overwhelming. From 1921 to 1950 no less than 110 million inhabitants have been added to India's teeming masses—more people than that of the United Kingdom and France together contain and just two-thirds the population of the United States today.

Predictions in demography are very hazardous inasmuch as population growth depends on many factors—social, cultural, economic, health and political conditions—which have not yet all been correctly diagnosed, and which may vary from country to country and from period to period. Still, while formulating a policy or taking a decision, we have to proceed on some basis. The Census Report of 1951 estimated that the Indian population is likely to increase from 361.3 million in 1951 to 407.8 in 1961, 452.7 in 1971 and 515.7 in 1981, provided—

(*a*) the rate of population growth is not checked by the widespread use of contraceptives or other methods;

(*b*) there is no epidemic on a large scale and the mortality continues to be of the same order in the future as at present; and

(*c*) there is no breakdown in food-supply.

According to Kingsley Davis, India and Pakistan's current rates of increase, if continued, will double their already swollen population of 1947 in 58 years.

It may be that the calculations of the Census Commissioner and Kingsley Davis are proved to be under-estimates. For, the percentage rate of increase is almost certain to go up as, owing to the rapid strides that preventive medicine has made in the last few years, diseases like malaria are controlled and sanitation is improved and the balance of births over deaths or the gap between the two increases. Our population, therefore, is likely to grow more rapidly in the future than it has since 1921. This is the conclusion arrived at in an unpublished study[1] quoted in the Report of the Food-grains Enquiry Committee, November, 1957 (pp. 56-57):

> In regard to the likely trend of growth of population there are widely different assumptions. The Planning Commission has assum-

[1] Coale and Hoover: Office of Population Research, Princeton University—Unpublished Study.

ed that the population will grow by 12.5 per cent during the decade 1951-61. On the basis of the birth and death rates obtained by means of a sample census conducted by the Registrar-General in 1952-54 all over India, the annual rate of natural increase of the population, which is the annual excess of births over deaths, turns out to be 1.5 per cent. It seems reasonable to suppose that the population did in fact increase at this rate during the quinquennium 1951-56. However, some experts are of the view that it may grow at a faster rate during the next quinquennium, 1956-61, due to further decline in mortality. According to them the crude death rate during 1956-61 may be lower by about 5 per thousand than what it was during 1951-56. On this basis we may have to allow for a population increase at the rate of 2.0 per cent per annum during the period of the Second Plan.

This conclusion finds support from the following news-item published in the *National Herald*, Lucknow, dated January 19, 1959—

> Births and deaths registered in towns with a population of 30,000 and more during November last were of the order of 32 and 12 per thousand of population respectively as against 33 and 13 in October according to an official press release.

On the one hand, we are faced with a rising rate of population growth. On the other, the land area of the country remains constant. The Census Report of 1951 gives changes in the area of cultivated land in 'cents' per capita of the entire population as follows:—

1891	...	109
1901	...	103
1911	...	109
1921	...	111
1931	...	104
1941	...	94
1951	...	84

While the rural industries during the British rule declined, the growth of urban industries and services was not able to offset the population increase. The relative dependence on agriculture for employment in the country as a whole has, therefore, gone up and there has been an increase in the number of cultivators and cultivating labourers combined, working on a given area of land, and in non-earning dependants.

As regards yields of food crops per acre, evidence conflicts whether they have remained stable or gone down. A recent study by the Indian Council of Agricultural Research shows that, by and large, the yield per acre has tended to remain stationary during the

past several decades. "All the attempts at agricultural improvements...have served merely to postpone the diminishing returns which inevitably follow increasing pressure on land".[1] Anyway, two facts are not in dispute: the productivity of land in India is far below that of most other countries; second, in or about 1880 India was usually a surplus producer of food-grains, but for the last three decades it has been a net importer. As we have already seen, food-imports since independence have averaged worth Rs. 125 crores a year.

As regards the quality of food that our nationals are able to get, or their levels of consumption, the following table quoted by Horace Belshaw, in which some selected countries in pre-war years have been rated according to 19 indicators, would make the position clear—

TABLE L

Country	Underweighted	Weighted
United States	100	100
Canada	80.6	83.7
United Kingdom	75.6	76.6
Philippines	25.7	21.6
India	20.8	16.8
China	18.0	13.8

Horace Belshaw says:

> These selected comparisons are not intended, as precise measures of differences in levels of consumption, still less of welfare, but merely to remind the reader of the rough order of size of the differences in developed and under-developed countries. There is no doubt that these are considerable. While any single indicator may be open to criticism, the general picture is one of levels of consumption which are so low that it would not seem to unduly strain the use of words, or be an undue concession to Malthus, to describe the population in many Asian countries as living pretty close to the subsistence level (Vide *Ibid*, pp. 21-22).

The question, however, arises whether it is under-development of economic resources that India suffers from, or over-population. Those who hold the former view contend that means of life can in-

[1] Population and Food Supply in India, *Agricultural Situation in India*, Vol. VII, No. 8, New Delhi, November, 1952, pp. 448-449.

crease as fast as population growth, and that the problem is not one of increasing population and vanishing resources, but one of under-production and mal-distribution. Malthus's apprehensions that, unless population growth is restrained by preventive checks voluntarily exercised, it will be prevented by the means of subsistence which will gradually decline, or other positive checks like disease, war and famine, have—it is pointed out—been falsified in respect of Western Europe, North America and Oceania, first, by innovations or improvements which he did not foresee; second, by increased capital formation which became possible out of the increased income resulting from innovations. These changes enabled productive power to grow more rapidly than population. If Malthus has been proved wrong in respect of some countries, he can be proved wrong in respect of others also.

If a considerable segment of our population is underfed, under-clothed or under-housed,—the argument proceeds—it is because of defective exploitation of our resources and not because of the niggardliness of Mother Nature—because we do not work hard and well enough. India may be faced with tremendous problems, but she is fortunate in having plenty of soil, water, sun and raw materials. The total production of food can be doubled, or even quadrupled by a marriage of modern science and technology with agriculture and food production. Whereas till date we have only just about scratched the surface of the hidden wealth of this country. What is needed is courage and skill to find food and employment for all instead of taking a defeatist attitude that there is no other solution but birth control. Twelve years ago, it is said, the whole economy of Federal Germany was shattered, her factories were in ruins, almost every worker of her 70 million was unemployed. In addition, 8 million refugees had been dumped on her from the East. But she did not sit and weep and introduce 'family planning'. Her answer was hard work. Today her difficulty is to find enough workers. There is no reason why technological improvements and capital investments should not be capable of taking care of population increase in India as they have done in Germany recently or other countries of the West.

A country may be under-populated and still suffer from poverty and unemployment. "Soil productivity", says Josue De Castro, "is not an absolute. Like population density, it is variable, a function of the prevailing kind of economic organization. The soil has neither absolute productive limits—Vogt's 'biotic potential'—nor absolute demographic limits. The relation to the soil has been handled with an inaccuracy and a blind empiricism repugnant to the scientific spirit. Earl Parker Hanson is entirely right in pointing out: "Such

neo-Malthusians as Vogt seem totally unaware that it is never a land that is over-populated in terms of inhabitants per square mile; it is always an economy, in terms of inhabitants per square meal." To prove it, he cites the case of Brazil:

"To judge by its current low standard of living, Brazil is woefully overpopulated with 40,000,000 inhabitants. But to raise its standard of living, Brazil must diversify its economy, must industrialise, and for that it is so definitely underpopulated that the shortage of labour is one of the chief obstacles to real modernization" (vide *Geography of Hunger*, p. 238).

Poverty of some countries is entirely due to their defective economic system. Population theories in these countries, according to Marxists, have been used almost invariably as a prop for the static view of society and against all proposals for revolutionary change—as a refuge of social reactionaries. It is pointed out: "While there are examples of low standards of living side by side with rapid population growth, this does not prove that population growth is the cause of a low standard. On the contrary, many countries have experienced a rise in national wealth and income per head of population (for example, the United States, England and Belgium) while their population increased rapidly; and a good argument can be developed to show that population growth has been one of the main factors not only of economic betterment but also of political and cultural greatness. Examples of rapidly increasing population rising in wealth and influence abound, but there are none of a declining population doing so".[1]

The advocates of the other view hold that population change and economic development are inter-linked, that the Indian people have apparently already reached a stage where density and rapid growth of population are impeding economic development, and that economic expansion cannot for ever compensate for a constant increase in population. "Any attempt to compensate indefinitely on the economic side for population increase is bound to fail, because human beings live in a finite world. Atomic energy, use of sun's rays, harnessing of the tides, all may enormously increase the food supply, but they cannot for ever take care of an ever-growing population".[2]

We may educate our people, our engineers and agrarian economists may do their best, we may arrange for a re-division of the land, and we may divide up the purchasing power of the Rajas and

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[1] *Population Growth and Living Standards*, Albert Nevett, *International Labour Review*, pp. 445-49, November, 1954.

[2] *The Population of India and Pakistan*, 1951, p. 222.

Maharajas. But how far would these palliatives take us? The basic trouble, it is contended, is excessive parenthood.

Finally, granted that we can produce food in virtually unlimited quantities—but what are we to do about space? The total land area of the globe, including desert, ice and mountain, is only fifty-six million square miles. Suppose we allot each person only one square yard for standing room. Then if world population increases by as little as one per cent per annum, W. Arthur Lewis[1] points out, there will be standing room only in as little as 1,120 years from now. Calculations for India separately will also give similar results.

In actual fact, there is genuine truth in both the view-points and one need not take up an extreme position. The terms 'under-development' and 'over-population' do not connote any absolute quantities, but imply a relationship to something else, just as 'too hot', 'too high' or 'too small' do. A country is over-populated or under-populated in accordance with the ratio that the size of its population bears to the quantity of its economic resources: it is developed or under-developed in accordance with the level of exploitation of these resources. A country may have a small population-resources ratio, and yet be a poor or under-developed country if its resources have not been well or fully exploited. Another country may have comparatively a higher population-resources ratio, and yet be a rich or developed country if its resources have been better exploited. The economic conditions of a country are determined not by the absolute quantity of goods it produces or the absolute number of its inhabitants but by the ratio which the goods and the inhabitants bear to each other. If production of wealth is large as compared to the number of consumers, the country will be regarded as wealthy, howsoever numerous its population may be; if small, it will be regarded as poor, howsoever little its population may be. If production of wealth proceeds at a higher pace than does increase in population as in the USA today, consumption of levels will go on rising. If it does at a comparatively lower pace, there will be retrogression of economic standards.

Horace Belshaw has put the whole matter admirably in a nut-shell. He says—

> Certainly population density has a bearing on levels of consumption, but it should be defined in terms of the relationship between size of population and resources which can be utilised with existing capital at existing levels of technology, as affected by (and influencing) economic and social structure and organisation. In the same way, the problem of improving levels of consumption is not merely one of the rate of population growth, but of the rate of growth in relation to the rate of increase in capital formation and the rapidity

[1] *The Theory of Economic Growth*, George Allen & Unwin Ltd., 1957, p. 309.

and effectiveness of technological improvements in the utilization of natural resources, as affected by (and influencing) changes in economic and social structure.[1]

The annual compound rate of population growth in India is less than in many a developed country. The latter have high consumption levels and in most cases are able to improve them still further, even though their populations are growing fast. In India which is under-developed and poor, the prospects of improvement are precarious and relatively much less; in fact, maintenance of existing levels of consumption will present not a little difficulty. Statistics prove that the gap between living levels in India and the more highly developed countries has actually widened in the last quarter of the century. This is shown by the following table. The two terms, *'per capita* money income' and *'per capita* product', used in the table, connote different concepts, but in effect there is not much difference and the gap between the various countries is not affected:

TABLE LI

Countries	PER CAPITA MONEY INCOME IN RUPEES IN 1931-32	PER CAPITA PRODUCT IN US DOLLARS IN 1952-54
India	65	60
	(1)	(1)
USA	1406	1870
	(21.6)	(31.2)
Canada	1038	1310
	(16.0)	(22.0)
Australia	980	950
	(15.1)	(15.8)
France	621	740
	(9.5)	(12.3)
Germany **	603	510*
	(9.3)	(8.5)
Japan **	281	190
	(4.3)	(3.2)

Sources :—Second Col. *Pressure of Population and Economic Efficiency in India* by D. Ghosh, Indian Council of World Affairs, Oxford University Press, 1946, p. 29.

Third Col. U N O Statistical Papers Series E No. 4, *Per Capita National Product of Fifty-five Countries* : 1952-54, New York, 1957.

* Figures relate to Western Germany alone.

** Figures for Germany and Japan show a decline because of the devastation and set-back caused by the Second War and occupation of the two countries by foreign forces for several years.

[1] *Population Growth and Levels of Consumption* by Horace Belshaw (1956), George Allen and Unwin Ltd., London, p. xvii, Introduction.

The reason for this gap lies, as already noticed, primarily in the high land (or physical resources)-man ratio and, secondarily, in greater propensity to innovate in these countries compared to India. Their higher rates of capital formation, which are an immediate cause of improvement in consumption levels despite increase in population, are themselves an effect of these two causes or factors.

It is true that if economic production can advance faster than population can grow, over-population need not occur; but from this the conclusion, particularly in the conditions of India and other undeveloped countries, that we can concentrate on economic development and ignore population, does not by any means follow. In these countries the rates of financial savings and of capital formation in relation to current population increase are so low that the prospects of growth in output being greater than growth in population are not great; even a small diminution in the rates of population growth, therefore, may make a difference to the chances of raising levels of consumption. It is to be remembered that in spite of their economic advantage the Western societies have all taken to birth control. They have not remained content with innovations and increased capital formation alone.

If we adopt the same techniques, apply as much capital, possess equally skilled workers, as the advanced countries, we can produce not only enough for the existing population, but also for a larger number of people. After assessing the prospects of increased yield due to increased acreage, an increase in the area under irrigation, and methods other than irrigation, the conclusion is expressed in the Census Report for India, 1951, (p. 206), in the following terms: "Of course, there will never be a point of time at which it can be said that the last improvement has been effected. But if we draw the moral correctly from the many unmistakable signs which go to show that the law of diminishing returns is in effective operation, we should make up our minds to the fact that our effort to keep pace with unchecked growth of population is bound to fail at some point. If the analysis of the subject.....is even approximately valid, we should be able to go one step further and fix this point by saying that it is the time at which our total number reaches and passes 45 crores".

According to the appraisal made in the report, it might be possible to achieve an over-all increase of agricultural productivity by about one-third of its present level, which would correspond to the needs of a total population strength of 45 crores. This figure, at the rates of 1941-50, was likely to be reached round about 1969. This estimate of possible increase in agricultural production may be pessimistic—we may be able to produce far more and sustain a

far larger population. But in the ultimate analysis, since the two variables in question affect each other, economic production cannot permanently be advanced in the face of an ever-increasing population. There must come a time when the total production will go up no further with further increases of man-power. Indeed, the time has arrived in many parts of the country already.

Innovations or improvement of soil and of plants can increase the product in excess of the increase of people, but there is a limit to such improvement: improvements can be effected frequently, but not continuously. The ultimate factor, the land, cannot perform miracles. There is a limit to what the land can produce—a limit to the extent to which labour and improvements brought about by scientific knowledge and capital investments can be substituted for land. Additional expenditure and additional labour on a given acreage below a certain limit bring less and less results per unit of expenditure or per unit of labour; so the amount of land available in a country is singly the most vital factor in terms of its population policies. If the size of our average farm continues to shrink year by year, as it is rapidly doing since 1921, we cannot be far from the point at which the most efficiently worked unit will be too small for the needs of the farmer and his family. We must, therefore, sit up and think—think furiously.

This is as regards agricultural production. As regards industrialisation, it has already been considered in a previous chapter as an employment source or an alternative to any population policy at all. The conclusion was reached that no conceivable industrialisation, at least, on the factory scale, will be able to absorb current and prospective increases in India's population. That it has not been able over the past fifty years to reduce the proportion of population dependent on agriculture is undisputed.

The principle that more men result in more product per acre and more total product, and that fewer men result in less product per acre and less total product, explains the resistance of a crowded land to manufacturing. "The evidence from India and China together with the principle which makes the evidence cohere, ought to put an abrupt stop to the recurrent proposal that the overcrowded countries undertake manufacturing as a cure for their poverty, and it ought to take the haze away from the truth that it is necessary to meet the population facts with population measures". (*Population on the Loose*, pp. 63-64.)

The opinion that an increase in population will itself increase productive power per head of population derives support from the fact that population growth in the past has, in certain countries, been accompanied by improvements in levels of living. But it

does not follow that the former is the cause of the latter: increase in productive power is rarely, if ever, the result of the increase in workers or population *per se*. Nations with increasing populations have risen in affluence and influence only when they have got started with industrialization, that is, when their economic apparatus expands with still greater pace—when capital formation and technological improvements occur at a greater rate—or, at least, *pari passu* with population. England, Belgium and other countries of Western Europe built up their prosperity on the exploitation of other peoples and countries. It was only in its pioneer days when there was vacant land to cultivate and vast mineral wealth to exploit that growing population was an asset in the USA. It can be and is an asset today in certain countries of Africa and Latin America and also, perhaps, in Australia, Canada and the Soviet Union—countries where there is an abundance of virgin land and other natural resources. New factories need workers, roads must be built, towns and villages expanded, frontiers conquered. But, perhaps, there is not a single example where a nation with an increasing population has attained a position of political or cultural distinction while its economic production has not kept pace or cannot keep pace with population. Population growth by itself or at a rate higher than wealth can multiply, will only serve to lower the consumption levels, with all the misery and degradation that are associated with want.

In this connection it is worthwhile to listen to Vera Anstey's words:

> First and foremost, it must be definitely recognised that general prosperity in India can never be rapidly or substantially increased so long as any increase in the income of individuals is absorbed not by a rise in the standard of life, but by an increase in the population. The population problem lies at the root of the whole question of India's economic future, and it is useless to try to bilk the fact.[1]

The dilemma that faces the country consists in the tendency of population increase to absorb any increase in the national real income. If every increase in our national wealth is absorbed by the increase in population, putting us back where we originally were, we will never be able to solve the problem of food supply or our economic problem in general. If levels of consumption are to rise, national real income must in the long run grow faster than population.

The existing population of the Union of India increases by five million every year, if not more!! This increase is obviously a calamity rather than a blessing. For, those five million people only

[1] *The Economic Development of India*, London: Longmans, 1929, p. 474, quoted in *The Population of India and Pakistan*, p. 203.

make the economic situation harsher or more difficult for the existing population. Whatever economic improvement we are able to achieve during the year is cancelled to that extent.

India's destiny in the next few years, according to a private research study, *viz.*, a recent issue of *Population Bulletin*, Washington, published by a non-Government scientific body, will be controlled by its success or failure in coping with its growth of population. It said: "A period of grace still exists for India, but the time is short. If every year no effective attack is mounted against high fertility, India moves nearer the demographic point of no return. The rising tide will swamp its economic improvement".[1]

We need not be so pessimistic about our destiny as our American friends, but at the same time we cannot afford to be complacent. While we will and should make all efforts to increase our agricultural and industrial production, we will have to so plan that our population does not increase at a pace which negates or largely negates these efforts. Work in the sphere of economic production and of population control can go on simultaneously, both being equally important. We do not have to choose between increase in population, on one hand, and industrialisation or economic development of the country, on the other. On the contrary, we should industrialize our country even if we decide to control births, and we may have to restrict the growth of our population even if we can industrialize our economy. The issue is not between population control versus economic development. We can proceed from two angles at the same time: (a) production can be increased, and (b) the rate of population expansion can be retarded. We may even, rather should, regard economic production as of primary and greater importance and population control as of secondary and lesser importance. But it will be a mistake to foreswear any demographic policy altogether and simply try to step up economic production, just as it would be a mistake to simply foreswear any economic policy and try to do it all on the population side. In actual practice this allocation of priorities will make no difference, for our efforts in one direction will not stand in the way of, or contradict our efforts in the other direction.

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[1] Vide *Hindustan Times*, New Delhi, December 16, 1958.

CHAPTER XXIII

MEANS OF POPULATION CONTROL

Slowing down of the growth rate being a logical approach to improving the Indian living standards, we should set about seriously searching for ways and means of achieving it. Demographically speaking, there are only three ways of doing this—by raising the death rate, encouraging emigration, or lowering the birth rate. Nobody can seriously recommend the first course. Human life, except under extreme group necessity, is an end in itself and not a means to an end, economic or other.

As regards emigration, with India's massive population it does not offer much of a solution. The empty lands, in relation to the size of our population, are not quite so empty as some of us wish they were. Second, as we have already seen in a previous chapter, the doors of almost all countries are already shut to India's nationals. Our people are meeting and would continue to meet with serious resistance if they seek to migrate to foreign countries on a permanent basis. But, supposing the almost impossible were to happen and there was no resistance to settlement of our people in foreign lands, large parts of the world would soon become filled with Indians which will lead to development of minority problems and serious conflicts. Third—and it is this that matters—emigration with a continuing high birth rate and declining death rate would afford no relief, as shown by the experience of Italy. Between 1880 and 1920, 4½ million people migrated from Italy to the United States and 12 million more to other countries. Yet, because the birth rate remained high, population of Italy grew, in that same period, from 29 millions to 39 millions. During the years of greatest migration the population of Italy increased faster than it did before or since. Similarly, if, say, fifty million people were to migrate out of India, the relief from population pressure would last not more than 10 years. The benefits from their departure would be very temporary, indeed, because of the balance of births over deaths of those who would remain. Improvement in medical and sanitary facilities together with measures taken to provide a certain minimum of food to the poorer sections of the community—in fact, humanitarian advances in general—by the very process of saving lives, make worse the over-all tragedy of population increase, which is a clear pointer to disaster.

It needs no elaborate argument, therefore, to establish that curtailment of birth rates is the only alternative left to us. If death rates continue to fall, as they will, we will soon be in a mess unless birth rates also fall much to the same extent.

Quite apart from whether the threat of over-population will actually materialise or not, family limitation or spacing of the children is necessary and desirable in order to secure better health for the mother and better care and upbringing of children. It is so obvious that excessively frequent child-bearing results in sickness and misery, drudgery and ill-health, both for the mother and for the children. It should, therefore, need no arguments for a husband to appreciate that he should not over-tax the strength of his wife, or for a couple to realise that they should not procreate more children than they can hope to educate and rear healthily and otherwise to suitably provide for. Contraception would enable fathers to space their children with due regard to the health of the mother and make sure that every child is a wanted child. There could not be a better form of investment, *viz.*, giving the next generation proper care, good health and instruction. How the women think about it all will be clear from a letter which Queen Victoria wrote to the King of Belgium in 1841:

> I think, dearest Uncle, you cannot really wish me to be the *Maman d'une nombreuse famille*, for I think you will see with me the great inconvenience a large family would be to us all, and particularly to myself; men never think, at least seldom think, what a hard task it is for us women to go through this very often.[1]

No doubt millions and millions of women, in a more or less dumb sort of way, do desire release from perpetual child-bearing and all the misery that so often accompanies it.

While it is conceded by most that birth-control may be conducive to the health of the wife and the children, it is contended that it will have an adverse effect on the health of the husband. In answer to unproven views of this type, it will suffice to quote the following conclusion of Dr. C. V. Drysdale:

> Nothing can do away with the fact that as birth rates have declined (in the West) the longevity of both men and women has enormously increased—from the figures of 35 to 45 years before birth control commenced to 60 to 65 years today, and that it is still rapidly increasing. Moreover, recent figures have shown that the improvement in the death rates has taken place to a most remarkable extent, especially during the reproductive period, both in men and women.[2]

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[1] Sten S. Wilson, 'Child-Bearing and the Standard of Life,' *International Labour Review*, Vol. LXIX, No. 1, January 1954, pp. 73–76.

[2] *Judgment on Birth-Control, Eugenics Review*, January, 1933, quoted in D. Ghosh's *Population Pressure and Economic Efficiency in India*, p. 105.

The main reasons in order of importance vouchsafed by married couples to the Royal Commission on Population in UK (1949), for using birth control methods were: (*a*) that more children could not be afforded, (*b*) to space pregnancies, (*c*) for health reasons, and (*d*) that parental instincts were satisfied with the children already born.

Until recently, Communist authorities everywhere, including China, have been saying that a large population is really no problem in a socialist society. Marx had held that over-population was purely the product of a capitalist society and could not occur under socialism. In China, however, there was now a growing demand for family planning. Prime Minister Chou En-lai's reason for the necessity of family planning, which he vouchsafed to the Indian Delegation to China led by Shri M. V. Krishnappa[1] in 1956, was to space the number of children suitably with a view to improving the health of the mothers and the education of the children. As soon as a good method of contraception was discovered, the Government of China intended to undertake a country-wide campaign for the adoption of family planning by the Chinese people. For what the Chinese Prime Minister may have left unsaid, the Communist government of the country might be finding reasons that have led to birth-control in other countries, valid in their circumstances also. A policy which might be right in relation to the special circumstances of Russia—and it is these policies that have usually guided Communists all over the world till now—might not be right in relation to conditions of such countries as China and India.

Through medicine, sanitation and public-health measures, man has interfered with Nature by combating diseases and prolonging his life. Since birth and death are a pair of opposites and have to keep in step with each other, he must to an equivalent degree now interfere with Nature by controlling the production of off-springs. If it is not sinful to practise medicine and sanitation, neither would it be sinful to practise birth control. From a purely physical point of view, birth control would also be easier than death control.

Gandhiji admitted the necessity of birth control but believed that there was only one sound method, *viz.*, that of abstinence. He said: "There can be no two opinions about the necessity of birth control. But the only method handed down from ages past is self-control or *Brahmacharya*. It is an infallible sovereign remedy doing good to those who practise it. And medical men will earn the gratitude of mankind, if, instead of devising artificial means of birth-control, they will find out the means of self-control. The union is

[1] Para 44, Chap. II of the Report.

meant not for pleasure but for bringing forth progeny. And union is a crime when the desire for progeny is absent".[1]

For Mahatmaji, sexual pleasure was inherently sinful. It was justified only when it served a higher purpose—reproduction. It followed that the only permissible form of birth control was abstinence or self-control. There are many Hindus (which include all religious leaders) who agree with Mahatmaji that any method which allows people to have sexual pleasure without risking the penalty of having children is a materialistic innovation and promotes immorality.

Says D. Ghosh in this context:

> The moral arguments which are usually advanced against birth control are two. First, it is considered unnatural and immoral; those who use contraceptives are supposed to interfere with Nature and cheat her of her end; they gratify their passions, and yet avoid conception which is its natural consequence. On this view of things, however, every act of human intelligence should be considered unnatural and immoral. We are constantly controlling, directing and thwarting Nature to serve our purposes rather than her own. And users of contraceptives cheat Nature far less than she cheats herself; for, out of every 5 million sperms ejected at each orgasm, only one finds its way to the ovum to fertilize it; the rest die after a fruitless existence. Secondly, contraceptives are supposed to promote excessive sex indulgence in and out of marriage. Some abuse there is of the freedom from the consequences of sexual union which contraceptives secure; but the evil does not seem to be as serious as it is made out. Hosts of normal persons in the UK, for example, have not only had easy access to the means of birth control for a long time, but they have consistently applied them. But to assume that they have indulged excessively and to their undoing is in accordance neither with everyday experience nor with the Registrar-General's statistics.[2]

For the vast mass of mankind, therefore, who cannot rise to the heights of Gandhiji, the problem becomes one of control not by abstinence, or restraint of sex instincts, but by limitation. Recent surveys have proved that public opinion in the country, both urban and rural, is in favour of fewer children. They know why the children come and yet, being fashioned of the common clay, they cannot help it. The fear of undesigned parenthood or unwanted children has not proved sufficiently powerful as a restraining force.

A Family Planning Pilot Research Project being conducted in several villages of Uttar Pradesh has revealed that 60 per cent of the mothers and 55 per cent of the fathers in these areas were eager to learn methods of family planning. About 70 per cent of the

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[1] *Young India*, March 12, 1925.

[2] *Pressure of Population and Economic Efficiency in India*, Indian Council of World Affairs, Oxford University Press, 1946, pp. 105-106.

married women in these villages recorded that they do not want to have more than three or four children in all, at an average spacing of three and a half years.

Mrs. Shakuntala Paranjpye, who has been working in different parts of India for over 13 years in this sphere, said in her report to the First All-India Conference on Family Planning (Bombay, 1951)—

> It has been my experience that most people, regardless of their social status, are willing and grateful to receive advice in spacing and limiting their families. In slums and rural areas I have met with the same response from people as in middle class localities. In fact, people of the working classes, whether they work in the cities or villages, have their roots in the rural parts of the land and readily realize that while they multiply, their holdings do not; that when a tree bears too much fruit it often succumbs under the burden and in any case such fruit is of a less quality than when it bears less. . . .[1]

A recent survey made in Baroda city (population 2,11,000) showed that from 63 per cent to 77 per cent of women, classified according to language groups, favoured birth control, and between 44 per cent and 62 per cent favoured either contraception or an operation. Those favouring control of size of family by one method or another varied from 70 per cent to 82 per cent. Those favouring control of size of family by moral restraint as well as contraception, grouped according to income instead of languages, were between 69 and 100 per cent of the total in each income group.

The Director of the United Nations Office for Population Studies in New Delhi, in 1953, published the results of a survey carried out in Mysore. Here it turned out that 60 per cent of the urban and 40 per cent of the rural dwellers interviewed took a positive interest in the limitation of births; in other areas the percentage rose as high as 70.

Addressing the fourth annual meeting of the Family Planning Board, the Union Minister of Health, Mr. Karmarkar, declared that "there is a general acceptance of the family planning programme in this country".

Another proof—if proof is at all needed—of the intense desire to limit the number of their children, can be seen in the fact that in many parts of India married women take to induced abortion, than which there could not be a more objectionable method of birth control. Infanticide also, which prevailed in certain communities till the last century, could in part, be traced to this desire.

The question now arises as to upon which of the married couples, in particular, the obligation in India to practise birth control lies in their own as well as in the national interest. Every man—let us not

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[1] *International Labour Review*, January 1954, pp. 74-76.

forget—owes a duty not only to his wife and his children, but also to the nation. Our general aim as suggested in the Census Report, 1951, may be defined to be: so to limit the number of births that they do not materially exceed the number of deaths and thus achieve a substantially stationary population before our number exceeds 45 crores.

According to the Census Report the total number of births which occurred in the course of one year in the decade, 1941-50, among about 1,000 people of India was 40. Among these 40 births, 8 births were first births; 16 births were either first births or second births; 23 births were either first, second or third births; and 17 births out of 40 were either fourth births or births of higher order. Calculations made in the report show that if the number of children born to a married couple does not exceed three, the excess of births over deaths at the mortality rates of the last decade will be reduced to negligible numbers and a substantially stationary population achieved. A child-birth occurring to a mother who has already given birth to three or more children (of whom at least one is alive) in our circumstances, may, therefore, well be defined as 'improvident maternity'. If the figure obtained by expressing the number of births of this nature as a percentage of all births occurring in any particular area during any particular period of time be treated as 'incidence of improvident maternity', the following table for six countries based on the latest figures shows that this incidence in India (17 births out of 40) is the highest—

TABLE LII

Country	Incidence of 'improvident maternity'
1. India	42.8
2. Japan	33.9
3. France	19.7
4. USA	19.2
5. UK	14.3
6. Germany (Federal Republic)	12.3

A great many people in our country, then, need to practise birth control.

There are, broadly speaking, three indirect methods of birth control, which may also be called preventive checks to population growth, *viz.*, delayed marriage, voluntary restraint within marriage and artificial control of conception.

Throughout India, early marriages have been until recently the rule, but a deferment of only a year or two may make a considerable difference to total fertility. According both to medical and statistical evidence, greater number of births in almost all populations occur in the comparatively early years of married life: fertility of women in the first half (15-30 years) is much greater than in the second half (30-45 years) of their child-bearing stage. The Indian Census Report, 1951, gives on page 84 the child birth indices of two classes of mothers, *viz.*, those who commence child bearing during ages 15 to 19 and those who commence during ages 20 to 24 called Maternity Types A and B respectively, in a table as follows:

TABLE LIII

Age Group	Child Birth indices	
	Maternity Type A	Maternity Type B
Under 20 ...	1.2	.....
20 to 24 ...	2.0	1.3
25 to 29 ...	3.6	2.3
30 to 34 ...	4.8	3.7
35 to 39 ...	6.0	4.9
40 to 44 ...	6.8	5.8
45 and over ...	7.3	6.4
Total ...	31.7	26.4

The figures of this table indicate that if we can bring about a postponement of age of marriage by five years, maternity would be reduced by approximately one-sixth, which will be not a negligible gain, indeed.

Besides observance of continence or *Brahmacharya*, there is a method of birth control falling within the term 'voluntary restraint within marriage', though not in full consonance with Mahatmaji's

views or strict Hindu thought, yet approvingly mentioned in the Hindu scriptures, *viz.*, the 'rhythm method', or what is known in the West, as the rule of the 'safe period'. According to this method, which is suggested in the *Brahadaranyaka Upanishad*, people are merely advised to observe abstinence during particular days, or the middle-third of every menstrual cycle. This method, however, according to experiments conducted under Government aegis, has been found not to be completely effective.

Artificial control of conception is of three kinds, *viz.*, the non-appliance method, the appliance method and sterilization. The first is more or less synonymous with *coitus interruptus*, into the details whereof it will not be desirable to go here. The second consists in the use of chemical or mechanical devices which interfere with the natural results of sexual intercourse. They are designed to immobilize or destroy the spermatozoa or to prevent them from entering the womb. The difficulty is that very little medical and biological research has been expended on improving contraceptive methods and the existing techniques—the use of douches, jellies and pessaries which represent the latest development up to this time—are not very well suited to the Indian population.

> The peasants of India are too poor to purchase such devices, not able to understand them, probably would be repelled by the idea, are not careful or responsible enough to use them regularly and effectively, and do not understand the vast issues involved.[1]

So that a contraceptive adopted to the conditions of those countries like India, China and Indonesia, which need it most, does not exist at present. In fact, the position all the world over, so far as the technique of contraception is concerned, is extremely unsatisfactory. A fully satisfactory contraceptive is still to be found.

Sterilization of either spouse is a surer method. The operation on the woman—*salpingectomy*—can be performed at any time and does not ordinarily require a long period of hospitalization, but it is usually performed twenty-four to forty-eight hours after delivery because it is easier done at this time. Owing to the simplicity of the operation on the males, however, they are the ones who, in most cases, should be sterilized.

The severity of *vasectomy*, as the operation on the male is called, is no greater than a tooth extraction, and no more dangerous. The wide-spread notion that the operation changes sexual activities and desires, is not well-founded. The effect is to prevent the microscopic sperm cells from leaving the body. They come into being as before, and the male hormone comes into being as before; so there is no change in sex desire or in the psychological effects of sex rela-

[1] *Which Way Lies Hope?*, First Edition, 1952, p. 62.

tions. The sperm cells, as they disintegrate, are taken up by the blood as impurities and thrown off like other waste tissue. Thus, there is no disabling effect on the general health either. It is obvious that this operation should be undergone only by those men who want a technique of permanent conception control—say, a father of three or four children.

Until now contraceptives have been either chemical or mechanical. Research is now being directed along lines which may yield biological contraceptives. It is hoped that birth control by an oral pill is not more than a few years away. According to the *Statesman*, dated May 6, 1958, the Union Government is already experimenting with an oral contraceptive to be taken by males. Extracted from the common field pea (*pisun sativum*) and also synthetically produced in the laboratory, the effect of the contraceptive pills on about 800 women is being observed for the last two years at the All-India Institute of Hygiene and Public Health, Calcutta. Results so far are stated to be very satisfactory.

According to an article by Robert Sheehan, entitled *A. Pill to Cure Over-Population? New Birth-Control Methods are given their First Mass Test*, published in American *Life* Magazine, dated July 7, 1958, several US scientists, working with steroid hormones, appear to have found the answer to the problem of finding a simpler and more acceptable method of curbing fertility than the various mechanical obstruction and chemical supermicides. The compounds they have come up with are progestins. These are synthetic substitutes for the natural hormone progesterone that all women secrete when pregnant; progesterone is known to prevent further ovulation (the release of fertilisable egg cells) during pregnancy. This is exactly what the synthetic progestin does to the non-pregnant women —it inhibits ovulation. One such progestin, in pill form, is being used in the study which is being made in Puerto Rico. To these women who followed the regimen faithfully (one pill a day for 20 days of each month), it has given 100 per cent protection against pregnancy.

At this stage the total performance of the drug is far from definitive, and no one knows what setbacks may lie ahead. That such a progestin would effectively prevent pregnancy was no great surprise to scientists. But there remain many problems to be solved, both scientific and social. Is the drug non-toxic? Is its action selective, or might it disturb, beyond re-establishment, the delicate balance of the organism? What about individual differences in tolerance? How long can suppression of ovulation be continued without permanently sterilizing a woman? Scientists believe that at least five years of strictly controlled testing on at least 500 women (preferably of different ethnic groups), plus lifetime testing of an

appropriate animal species, are needed for dependable evaluation and final approval of the habitual use of such a drug.

Second, there is the possibility of inducing temporary sterility in the male or female through hormonal control or a hypodermic injection of a hormone. It will be a perfect contraceptive which will induce loss of fecundity for a given or definite length of time and will be revocable at will.

Third, research on certain plant materials used by the ancient peoples in many parts of the world is also under way.

When as a result of any of these researches a harmless, reliable and clean contraceptive is made available, it will revolutionize the whole field of family planning and the problem of the unwanted child—a problem of such serious import to India and some other countries—would have been solved.

In the ultimate analysis, however, the issue is more sociological than technological. A programme of family limitation will be a success only when the old values and sentiments of the people have been changed.

Besides the direct methods of birth control, it is said, there are, at least, two indirect factors, *viz.*, education and increased material prosperity, which tend to reduce human fertility. In our opinion, this assumption is not correct: these factors tend to reduce the birth-rates, not the fertility.

In 1950 the world had a total population of 240 crores. The rate of growth for various regions over the last two centuries is shown below—

TABLE LIV

Period	Total world population at the beginning of the period (in crores)	Rate of Decennial Growth				
		Africa	Asia	Europe	New World	World as a whole
1751–1800... ...	72.8	Nil	4.5	5.7	12.4	4.4
1801–1850 ...	90.5	1.8	4.4	7.0	15.5	5.1
1851–1900 ...	117.0	4.5	4.5	8.1	16.8	6.3
1901–1950 ...	160.8	9.8	6.8	6.0	15.1	4.0

The table indicates that the birth rates of Europe and the New World which had been constantly increasing since 1750, have been falling fast since 1900. The theory was advanced that this fall in the birth-rate among West European people and the people of the same stock in the New World was due to their rising standards of

living. In fact, the law or theory was a hundred years old. It was stated by Thomas Doubleday in 1853 as follows:—

> There is in all societies a constant increase going on amongst that portion of it which is the worst supplied with food; in short, amongst the poorest.
>
> Amongst those in the state of affluence and well supplied with food and luxuries, a constant decrease goes on.

This theory has, however, been disapproved by the findings of the Royal Commission on Population in the United Kingdom (1949). The Commission says: "There is, thus, an overwhelming volume of evidence in this and other countries that the rates of child-bearing are at present being greatly restricted by the practice of birth control and other methods of deliberate family limitation below the level at which they would stand if no such methods were practised".[1]

Thus, an improvement of the nutritional standards or other standards of living is by no means incompatible with the maintenance of a high rate of child-bearing, if the people so desired. It is due not to education or increased material prosperity, but to the practice of contraception which, during the last fifty years, has grown and become part of the normal mode of conjugal life among the majority of the people in Western Europe and people of their stock inhabiting the New World, that their birth rates have gone down.

According to the Royal Commission the percentage of women in the United Kingdom reporting the use of any form of birth control, classified according to date of marriage, is shown in the following table—

TABLE LV

Percentage of Women using Birth Control at some time during Married Life

Date of marriage		No. of women	Percentage who used birth control
Before 1910	...	161	15
1910–19	...	361	40
1920–24	...	342	85
1925–29	...	339	61
1930–34	...	440	63
1935–39	...	617	66
1940–47	...	974	55
Omitted	...	47	...
Total	...	3,281	

[1] Para 87, Chapter IV of the Report.

This table shows that there is a steady increase with date of marriage in the use of birth control at some time during married life. It should be noted that these percentage under-estimate the percentage of women who will eventually use birth control in the latter marriage cohorts,[1] since some of those not using it up to the time of the survey will subsequently adopt it. This accounts for the lower percentage in the last cohort.

Josue De Castro, the author of *Geography of Hunger*, (London, Victor Gollancz Ltd., 1952), also a believer in the theory that lack of sufficient food increases the rate of population growth, refers to experiments made on rats which showed that diets inadequate in protein increased fecundity, and says that the way this result came about in rats was also true of human beings. And foods with high protein content being usually more expensive than starchy foods, poor people cannot get enough of them. In further support of his thesis, de Castro cites the following data showing the direct connection between the protein intake and the birth-rate of fourteen different countries—

TABLE LVI

Countries	Birth Rate	Daily consumption of Animal Proteins (In Grams)
Formosa	45.6	4.7
Malaya States	39.7	7.5
India	33.0	8.7
Japan	27.0	9.7
Yugoslavia	25.9	11.2
Greece	23.5	15.2
Italy	23.4	15.2
Bulgaria	22.2	16.8
Germany	20.0	37.3
Ireland	19.1	46.7
Denmark	18.3	59.1
Australia	18.0	59.9
United States	17.9	61.4
Sweden	15.0	62.6

The figures show that fertility goes down as the consumption of animal proteins rises.

[1] The term, 'marriage cohort', is used to indicate groups of women married in a given set of years.

The author adds that the highest birth rates in the world are registered by certain peoples of the Far East, Africa and Latin America, where the proportion of animal products in the habitual rations does not reach 5 per cent of the total food consumed. In contrast to this, the lowest birth rates exist among the peoples of Western Europe, the United States, Australia and New Zealand, where the proportion of foods of animal origin in the ration reaches 17 per cent in Western Europe, 25 per cent in the United States, and 36 per cent in Australia and New Zealand.

The source or sources of figures given in the above table by Josue de Castro are not known. However, we give below figures for consumption of animal protein from an FAO publication, *The State of Food and Agriculture*, Part I, 1953, for per capita product from a UNO statistical paper series, E No. 4, *Per Capita National Product of Fifty-five Countries: 1952-54*, and for crude birth rates from another UNO publication, *Statistical Year-Book, 1956*, in various countries:

TABLE LVII

Name of Country	Average protein consumed per day per capita in 1950–53 (grams)	Per capita national income in 1952–54 (US dollars)	Crude birth rates (1951-55)
1	2	3	4
Japan	10	190	22.0
Ceylon	12†	110	38.7
Egypt	13	120	44.8*c*
Peru	14*b*	120	32.8*a*
Mexico	16*b*	220	45.2
Greece	18	220	19.3*a*
Italy	21	310	18.1
Chile	25.5†	360	34.0
Union of S. Africa (Whites) ...	26	300	25.6*a*
Venezuela	28.5†	540	45.1*a*
Colombia	30†	250	37.5
Austria	36	370	15.0

(*Contd.*)

TABLE LVII—(*concld.*)

Name of Country	Average protein consumed per day per capita in 1950-53 (grams)	Per capita national income in 1952-54 (US Dollars)	Crude birth rates (1951-55)
1	2	3	4
Germany, Western	37	510	15.7
Netherlands	40	500	21.9
Belgium	40	800	16.6
France	42	740	19.1
United Kingdom	44	780	17.7
Ireland Republic	49	410	21.3
Finland	50	670	22.1
Switzerland	51.5†	1,010	17.
Norway	54	740	18.6
Denmark	54	750	17.6
Canada	57	1,310	28.1
Sweden	59	950	15.2
United States	62	1,870	24.7
Australia	66*	950	22.9
Argentina	67	460	24.5
New Zealand	69.5†	1,000	25.8

(*a*) For 1951–54 (*c*) For 1951 * For 1950–51
(*b*) For 1951–52 † For 1950–52

Source :—For the second column : *Statistical Year Book*, United Nations, 1956, pp. 38–39.
For the third column : *The State of Food and Agriculture*, 1953, Part I—Review and Outlook, UN, Rome, Italy, August, 1953, p. 21.
For the last column :—*Per Capita National Product of Fifty-five Countries*, 1952-54, Statistical Papers, Series E, No. 4, UN, New York, pp. 8-9.

Note :—Figures for India have not been given, as birth and death reporting in the country is not complete or reliable and it is these reports that constitute the source of the United Nations' publications.

This table shows that there is no correlation between the consumption of animal protein or material prosperity and the birth rate. There are many a country which do not behave as the believers in the theory that increased material prosperity reduces human fecundity,[1] would like them to. Canada and New Zealand are more prosperous than European countries and yet their birth rates are higher than those of the latter. According to the United Nations Statistical Year Book, 1955, the crude birth rates of the USA and New Zealand per 1,000 population in the quinquennium, 1920-24, were 22.8 and 18.1 respectively; the corresponding figures for the quinquennium, 1951-55, as seen in the above table are 24.7 and 25.8. The fact cannot be disputed that during this period material prosperity of these countries has also increased which, again, proves that there is no incompatibility between improvement in living standards and a high rate of child-bearing.

There is also one important factor which is missed in these calculation, *viz.*, the reduction in birth rates brought about in several of the above countries by the use of contraceptives and other methods. Unless allowance is made for the births which would have occurred but for the practice of birth control, it is not possible to relate the birth rates with the consumption of proteins, or, for the matter of that, any other food, or with the extent of prosperity and the economic conditions obtaining in the different countries.

There is evidence in the Indian Census Report, 1951, also to the effect that birth rates are not governed by the social status or the economic standard of the families or classes concerned. There can be no manner of doubt that the agricultural labourers in India occupy the lowest place in the social and economic ladder. Yet, they do not have more children or grow in numbers faster than others. The following table gives the figures for Travancore-Cochin (now Kerala) for which alone these calculations were made—

TABLE LVIII

Maternity group	CHILD BIRTH INDICES	
	Age 45 and over	All ages
Agricultural land-holders and tenants' families	6.7	4.5
Agricultural Labourers' families	6.8	4.1
Non-agricultural families	6.6	4.2
Rural	6.6	4.3
Urban	6.4	4.2

[1] By 'fecundity' is meant the potential biological capacity to bear children; by 'fertility', the realised capacity, i.e., the actual number of children born.

We reach the same conclusion when figures relating to eastern and western plains of the State of Uttar Pradesh are compared. It is a well-known fact that economic conditions in the western region are better than those in the eastern, particularly, those in Meerut divisions as compared with Gorakhpur division. Residents of the former consume greater quantity of milk and milk products which contain a large percentage of protein and eat less rice which is a most starchy food, as compared with those of the latter. As regards the percentage of literacy, the figures for the two regions and divisions, taken from the Census Report of 1951, are given below—

	Percentage of literacy
Western plain	10.8
Eastern plain	9.1
Meerut Division	12.7
Gorakhpur Division	7.9

Yet, as the table on the next page will show, the birth rates in the former region and division are higher than in the latter. Figures of birth and death registration are not accurate, but there is no reason to suppose that the degree of error in one part of the State differs from that of another. In any case they may be taken as fairly indicative of the real trends.

The same results for the two plains for the year 1953 are evidenced by Census of India, Paper No. I, 1955—Sample Census of Births and Deaths—1953-54, Uttar Pradesh, pages 21 and 51—

TABLE LX

Registered Birth and Death Rates per One thousand, 1953, corrected for Omissions in Registration

Natural division	Birth Rates		Death Rates		Growth rate
	Registered	Corrected	Registered	Corrected	
West Plain ...	17.6	25.8	12.0	17.2	8.6
East Plain ...	13.9	18.3	8.9	11.6	6.7
Uttar Pradesh ...	15.8	21.7	10.1	14.2	7.5

TABLE LIX

Mean Decennial Rates

Region	Population in Thousands		Percentage increase	Births per 1,000 (Registered)			Deaths per 1,000 (Registered)			Actual Growth		
	1921	1951		1921-1930	1931-1940	1941-1950	1921-1930	1931-1940	1941-1950	1921-1930	1931-1940	1941-1950
1	2	3	4	5	6	7	8	9	10	11	12	13
Meerut Division ...	45,09	67,19	49.2	38.7	39.3	30.3	27.8	24.6	18.3	8.5	15.0	16.0
Gorakhpur Division	67,21	88,31	31.3	30.6	29.8	21.4	21.9	18.9	14.8	7.0	10.0	12.5
West Plain ...	167,29	227,71	36.1	38.9	39.3	29.5	28.9	25.1	18.7	6.6	13.4	11.4
East Plain ...	134,98	178,87	32.5	30.0	30.4	21.8	22.3	19.3	15.3	7.0	11.3	11.0
Uttar Pradesh ...	466,70	632,16	35.5	34.0	34.2	24.8	25.6	21.9	16.5			
		Corrected		39.9	38.8	34.9	32.7	26.0	23.8	6.4	12.7	11.2

Source :—Tables No. 40, 61, 63 and 77 of Part I-A and table No. A-II of Part II-A of Census of India, 1951, Volume II, Uttar Pradesh—Report.

Generally, figures from Kerala and Uttar Pradesh in India should be more reliable in assessing the effect of social status, education and economic conditions on birth rates than from any other country, inasmuch as here the results or birth rates are not affected by use of contraceptives. Birth control in India is yet practically non-existent throughout the entire population.

The conclusion, *viz.*, that education and material prosperity do not affect fecundity of a woman, receives confirmation from English figures also—

TABLE LXI

Specific Fertility of Married Women in Cochin (1936-37) *and England and Wales* (1931)

Age Period	Cochin	England & Wales
15–20	224	372
20–25	249	267
25–30	253	187
30–35	246	127
35–40	182	81
40–45	120	33
Total fertility	6,370	5,335

Remarks D. Ghosh:

> If all women in the two countries marry by age 15 and if no one of them dies before completing her forty-fifth year, the average Indian woman would give birth to between 6 and 7 children and the average English woman to nearly 5½ children. The Indian woman is seen to be not so much more prolific than the English inspite of our much higher birth rate. Indeed, when we take into account the fact that while in England and Wales contraceptives are in extensive use, in India they play as yet a small part in determining the flow of births, Indian women appear to be less fecund than the English. (Vide *Pressure of Population and Economic Efficiency in India*, p. 15)

The English are about thirteen times more prosperous and seven times more literate than the Indian.

It would seem, therefore, that neither material prosperity nor education has anything to do with the activity of the hormones. If the birth rates in the educated and prosperous sections of the society are less, it is due not to any biological change, but to change in attitudes—to the desire on their part to accumulate money and achieve social position through limitation of births. They have also

the knowledge, and the means to translate their desire into practice, which illiterate and poor people have not.

Horace Belshaw invites the reader's attention to the following:

> The generally accepted view is that the decline in birth rates was the result of industrialisation and urbanisation. Undoubtedly, there is a relationship, but its precise nature is by no means clear. We may indicate probable causes with some degree of confidence, but they appear to be many and we are by no means sure of their relative importance....New Zealand began to experience a downward trend of birth rates eighty years ago when neither greatly industrialised or urbanised nor densely populated. The trend appears to have begun earlier in the US than in the industrially more advanced and urbanized British Isles. So it is safer to regard changes in attitudes as arising out of the process of which industrialisation and urbanization were a part, as well as out of the actual effects of these latter. (pp. 25-26).

Industrialisation encourages the development of new patterns of living which lead to the control of high birth rates. Seen in this perspective, industrialisation is ultimately a means of reducing birth rates through changing the conditions of life and, thus, forcing people in their private capacity to seek the means of family limitation. Industrialisation, however, is a very slow process: even granting that it can be greatly accelerated, the time required would, nevertheless, permit huge interim growth in numbers, and thus as a population policy it has little to recommend in its favour. Industrialisation being instrumental to so many ends, its feasibility and character should be determined on grounds other than that it is found to be a means of population control in its later stages.

According to the First Five Year Plan:

> *While a lowering of the birth rate may occur as a result of improvements in the standards of living such improvements are not likely to materialise if there is concurrent increase of population. It is, therefore, apparent that population control can be achieved only by the reduction of the birth rate to the extent necessary to stabilise the population at a level consistent with the requirements of the national economy. This can be secured only by the realisation of the need for family limitation on wide scale by the people.* (p. 522).

The population problem has become the most fundamental of all human problems today, and cannot be lightly set aside. It affects every aspect of a man's social life: it affects him inasmuch as it affects the health and happiness of his family; it affects him inasmuch as it affects the economic conditions of his country; and finally it affects him inasmuch as it affects his international security and peace, for it is the problems of population pressure that largely underlie the issues of peace and war. No matter what the apparent or imme-

diate cause may be, many a war has its basic roots in economic differentials between nations—in uneven distribution of physical resources of the world relative to population of the various countries.

Countries that expand their population beyond the support of their food production have three courses open: either they produce industrial goods in exchange whereof they may purchase food, or reduce their population by emigrating and/or controlling their birth rates, or sink to lower levels of food consumption and, if these levels have already touched the bottom, owing to malnutrition, invite disease and starvation, with periodic visitations of epidemics and famine, so that only so many remain as can just subsist on the barest rations. Nations which are vigorous, industrialised and militarily strong, will seek either markets in which they can sell their manufactured goods and markets in which they can purchase their food, or *lebensraum* and, if they find an obstacle, will precipitate a war in the interest of survival. Countries like the USA and the USSR need not go to war in quest of food or *in the interest of self-preservation.* It is apparent from their land resources in comparison with their populations that they produce and should continue to produce sufficient to feed their peoples at their present rate of reproduction for centuries to come. If these two giants are today preparing for war, it is for reasons which are really rooted in the pugnacity or combativeness of human nature, though they might be clothed in terms of ideology. The case of those countries which depend upon outside sources of food, like the UK and Germany, which they receive in exchange of their industrial products is, however, different. If they cannot sell the latter or purchase the former, and are unable to dump their population in open spaces or comparatively sparsely populated regions of the world, they will go to war, merits of a dispute or question notwithstanding.

The population problem, therefore, is not the concern of population experts alone, nor even that of Governments alone. It is the vital concern of every thoughtful citizen. No practical action can result unless the population policy that may be proposed has the intelligent backing of informed public opinion.

In the West, family limitation propaganda was unofficial. But the situation in our country demands an all-out Government campaign using every available educational and propagandistic resource to take family planning to the very door of our people. Owing to the furtive air that clings to the subject, there is a good deal of ignorance in the country over the whole question of conjugal relations. This furtive air has to be dissipated: solution of the population problem will be found round the corner once our people simply begin to think about it. Oswald Spengler puts it thus—"When

the ordinary thought of a highly cultivated people begins to regard having children as a matter of pros and cons, the great turning point has come."

In China birth control is now being advocated in every home, with all the persuasive apparatus of the omnipresent State.

It must be recognised, however, that a direct approach to family limitation by education and propaganda is no more likely to achieve quick results than it did in the West, that alteration in population trends would take, at least, a few generations to materialise, and that there is little possibility of a change in birth rates sufficient to offset prospective decline in mortality over the next few decades. To control population is not only a matter of acquiring contraceptives and a knowledge of technique. The social and economic transformation which must accompany, if not actually precede, birth control affects, and is in turn affected by, a man's whole view of the meaning and purpose of life.

While, therefore, more active steps will have to be taken to tackle the problem of population control, emphasis on non-demographic measures cannot be relaxed. The difficulty in bringing about a deceleration in the rate of population growth in the next fifteen years, or so, when the battle for subsistence is going to be critical, increases the relative importance of economic development. National real income will have to be increased more rapidly than prospective population increases, not only so that consumption levels may be raised, but also so that the forces making for a retardation of population growth may be strengthened. Higher incomes, as we have seen, are likely to change demographic attitudes.

Altogether, the problem that faces India is exceedingly difficult. There is no simple 'open sesame' that will work the magic. While we should educate our children, marry them late, and carry on propaganda in favour of family planning laying emphasis on the values of continence, benefits of observance of the 'safe period', and even the advisability of an operation of either spouse (rather than on contraceptives such as obtained in the West), at least till biological contraceptives are available, we should plan simultaneously and, with a still greater vigour, for intensive agriculture and a co-ordinated and parallel development of industries, preferably agro-industries, so that each sector may generate adequate purchasing power which would help absorb the increasing production of the other sector. Action is needed on all fronts simultaneously.