

# NATIONAL INSTITUTE OF SCIENCES OF INDIA

Anniversary Address by the President, Professor P. C. Mahalanobis

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## NEXT STEPS IN PLANNING

### INTRODUCTION

India adopted planning for economic development with the initiation of the First Five Year Plan in 1951. At this stage, the plan was essentially a list of projects without any clear unity of purpose. A sense of strategy began to develop and certain broad aims were formulated in advance in 1954 for the preparation of a draft frame for the Second Five Year Plan. It was agreed that attempts must be made to get India out of the fear of unemployment in ten years or as soon as possible; to lay sound foundations for a continuing improvement in the level of living, that is, of the national income; and also to bring about greater equality of opportunities.

1.2. In 1955 India accepted socialism as the goal of economic policy. The Second Five Year Plan took a long term view of economic development over a period of 10 or 15 years or more, and adopted a basic strategy for this purpose which involved a crucial change in the outlook. Three years have nearly passed after the initiation of the Second Plan in April 1956. There have been many gains and some set-backs; and much experience has been gathered. We must now prepare our mind for the Third Five Year Plan which will have to be started in about two years. It is, therefore, appropriate that we should now consider the next steps in planning.

### REVIEW OF INDUSTRIAL DEVELOPMENTS

2.1. Before doing this it will be useful to consider previous developments in India in the context of the history of industrialization of the more advanced countries of the world. The industrial revolution started about two hundred years ago in the United Kingdom, the U.S.A. and countries of Western Europe where science and technology were highly developed. At first there was expansion of the manufacture of textiles and other consumer goods. The use of steel for industrial purposes started less than a hundred years ago. The world production<sup>1</sup> of steel was less than one million metric ton in 1870, and reached 4.4m. tons in 1880 and 28m. tons in 1900. In 1870, U.K. and Germany were producing about 200,000 tons per year and U.S.A. and Russia had just started. By 1880 U.K. and U.S.A. reached 1.3m. ton and Germany reached this level in 1885, and France in 1895. These countries were already industrialized and had a high level of living indicated by per capita income of from 400 to 600 U.S. dollars per person per year (at current dollars for 1955 and 1956) at the time they reached the level of production of one million ton of steel per year. Health and education also were fairly well developed with the number of physicians ranging between 3.6 and 16.3 per ten thousand of population, and with a proportion of school children between 12 and 19 per cent of the population. Developments were fairly rapid from this

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<sup>1</sup> Data on production of steel are given in Table (3) in the Appendix.

time and U.S.A. reached 4.3m. tons in 1890, Germany 4m. tons in 1895, U.K. 5m. tons in 1900 and France 4.7m. tons in 1913. During this period there was some further expansion of health, education and research which was broadly in accordance with the previous trend.<sup>1</sup> An output of 4 or 5 million tons of steel per year usually makes a turning point in industrial progress. At this level it becomes possible to establish comprehensive manufacturing complexes of steel, heavy machine building and heavy electrical industries, and chemical engineering.

2.2. Japan had started producing steel just before the First World War and reached one million ton in 1923 when Japan's per capita national income was still quite low and only 125 U.S. dollars. Health and education in Japan were, however, as highly developed as in the advanced countries of Europe and America. Japan reached 4.9m. tons in 1935, that is, in 12 years. It is important to note that modernization in Japan had started about 90 years ago with the Meiji Restoration with deliberate emphasis on health, education, scientific research and industrialization. Japan, for example, had made primary education free and compulsory before U.K.

2.3. Russia had reached the production of about one million ton of steel as early as 1895 but was quite backward in education and health with 1.6 physicians per ten thousand of population and with only 3 per cent of the population in primary schools. Owing to war, revolution and civil war, production in U.S.S.R. had decreased to 0.6m. ton in 1923, but recovered to 4.9m. tons in 1929, by which time education and health had also developed in a remarkable manner approaching conditions prevailing in the more advanced countries at corresponding epochs. China started very recently with 0.6m. ton of steel in 1950 and rapidly reached 5m. tons in 1956 and 10m. tons in 1958.

2.4. Until recently industrial developments in India were taking place rather slowly and in a somewhat imitative way of the earlier history of industrial growth in Europe and America in which we can distinguish four layers or phases. On the top or the surface comes consumer goods which can be established fairly quickly with the help of imported machinery. The second layer is the production of electricity, steel and other metals; this is highly capital intensive and requires large imports of machinery and also an appreciable amount of time. Next is the manufacture of heavy machines, heavy electrical apparatus and chemical engineering (for the production of industrial raw materials). This usually requires a much longer time but, once established, would enable a large part of the capital and producer goods being manufactured out of domestic resources. Even more basic is the expansion of health, education, science, and of scientific and technical manpower which takes practically a generation to mature.

2.5. Following the above pattern only upto the first phase of consumer goods, India had become the second biggest producer of textiles in the world and had also developed the manufacture of other consumer goods without however establishing the basic industries like metals, heavy machine building and heavy electricals. In fact, in India the production of steel had remained basically at a little above the level of one million ton after nearly half a century of the beginning of the industry, although the country has very large resources of iron ore of the best quality. The economy was developing only very slowly on the basis of immediate demands and supplies without any long range view. Also, there was comparatively little development of health, education, and science in relation to the size of the country and its population.

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<sup>1</sup> Information on certain characteristics of development is given for selected countries in Table (1) in the Appendix.

## GAINS IN THE SECOND FIVE YEAR PLAN

3.1. There were important gains in the Second Five Year Plan which marked a radical break with the old way of thinking. It was realised that unemployment and poverty can be cured only through rapid industrialization. It was not enough to expand the production of textiles and consumer goods. It was necessary to increase the supply of energy and of machinery and tools of production to create more employment. It was realised that the only way to do this in a big country like India was to establish, as rapidly as possible, the basic steel, heavy machine building, and heavy electrical industries and chemical engineering. This would make it possible to produce capital and producer goods of all kinds and thus expand industrial investments increasingly out of domestic resources. This is the only way to secure increasing supplies of machinery and energy, with which we can create more employment and also can give the workers more machinery so that the total production in the country can rise rapidly.

3.2. In India the highest priority must be given to the establishment and expansion of the basic industries. Large investments in the basic industries would, of course, give rise to an increasing demand for food, cloth and other consumer goods. In India it is possible and desirable to meet this demand by setting idle hands to work in the traditional way or in small scale industries to produce consumer goods and other necessities as much as possible. This would also create much employment all over the country.

3.3. It was appreciated that, in India, the production of an agricultural surplus is the key to industrialization. It is not only essential to grow enough food and fibres for our own requirements but it is also necessary to produce a surplus in the form of either industrial or food crops. In India agriculture and manufacturing industries are completely interlocked. Economic progress depends on the advance of both. Advance of one step in agriculture would supply food and raw materials for advance of one step in manufacturing industries which again, in its turn, would speed up irrigation and increase the supply of fertilizers and pesticides and help in the promotion of scientific research, which would lead to further advances in agriculture. The importance of the scattered or diffused phase of production, both in agriculture and in traditional and small scale industries, was broadly appreciated. It is also being increasingly realised that land reform and the organization of village co-operatives are urgent and essential needs for increasing agricultural production.

3.4. The Second Five Year Plan accepted the above strategy of economic development in a general way. It was decided to expand steel production to about 5 million tons; to give high priority to atomic energy; to establish a heavy machine building industry and the manufacture of heavy electricals; and also to develop prospecting for oil exploration and to establish oil refineries of our own. India would be now able to start developing large manufacturing complexes.

3.5. There were, however, gaps and set-backs also. An acute shortage of foreign currency occurred in the very first year of the Second Plan, which in my opinion was not inescapable but was largely due to lack of adequate tools and instruments of planning and also partly to lack of proper appreciation of the strategy of the Second Plan. The shortage of foreign currency created great difficulties. I discussed this question in my Anniversary Address last year. The remedy is in our own hands because in India we can manufacture capital and producer goods increasingly out of our own domestic resources, once the basic industries are established and developed. Therefore the only radical cure of this

shortage of foreign currency would be by building up the basic industries as rapidly as possible.

3.6. Foreign aid, especially in the form of long term loans for capital goods and technical personnel, would be of critical importance at the stage of what P.M.S. Blackett has called "assisted take off" in industrialization. Indefinite reliance on foreign loans is neither possible nor desirable. A continuing stream of short-term financial loans from abroad would not be of much help in the long run and may make the position worse. The chief source of capital formation must be domestic savings. Fortunately, the need of raising more resources is admitted and gradually action is being taken in this regard. One notable advance was the acceptance of the principle of an expenditure tax together with a tax on wealth.

3.7. In the highly developed countries of the West, taxes on commodities are usually looked upon as "regressive" as being a burden on the poor. Public enterprises are also expected to be run on a no-loss-no-profit basis. Fortunately our outlook is changing and it is being realised that in an underdeveloped country like India excise and customs duties, purchase tax on commodities or a levy on services would be convenient and adaptable methods to raise resources. It is also agreed in principle that public enterprises should earn and contribute increasing returns for purposes of national development.

3.8. It is encouraging that the question of scientific and technical manpower is receiving increasing attention. The subject is being studied at a technical level in the Division of Perspective Planning in the Planning Commission. A Standing Committee of the Cabinet has been set up for manpower; and administrative units have been established in the Central Government and in the States.

#### WEAKNESSES IN PLANNING

4.1. The Second Plan, no doubt, has been a great step in advance. It has set productive forces in motion which cannot possibly be reversed without disaster. There are, however, serious gaps and weaknesses.

4.2. Review of industrialization has shown that there is a close connexion between economic development and progress in health and education. (Some relevant data for both developed and underdeveloped countries have been given in Table 2 in the Appendix.) In West Europe and America there was simultaneous progress of industries and health, education and science. In Russia, before the first World War, the production of steel had reached 5 million tons but there was little progress in health and education; and there was revolution. In U.S.S.R., China and other socialized countries and also in Japan great emphasis was and is being given to progress in health, education and science *pari passu* with industrialization. India would soon reach the critical level of steel production of 5 million tons but is still backward in health, education and science.

4.3 Before considering these three points in some detail I shall refer to another disturbing aspect of the present situation, namely, the steady increase in unemployment.

#### INCREASE IN UNEMPLOYMENT

5.1. We do not yet have in India any regular reporting of unemployment. Some indications are, however, available from trends in the number of applicants

in the Labour Exchange Registers in India, for which some data are given in Tables (4) and (5) in the Appendix. It is disturbing to note that the total number of persons registering in these Exchanges had more than doubled in five years between January 1953 and December 1957. It is also worth noting that the Labour Exchanges can find employment for only a very few; and the average number of applicants for each notified vacancy increased steadily from 23.3 in 1953, year by year, to 33 in 1957. Also, as all notified vacancies were not filled by applicants recommended by the Labour Exchanges, the number of applicants for each effective placement was nearly 40 in 1953 and had steadily increased to nearly 51 in 1957. That is, the Labour Exchanges can find employment for only two persons or less out of every *hundred* applicants, on an average. This is not a criticism of Labour Exchanges but simply an indication of the heavy back-log of unemployment.

5.2. This back-log differs in different occupational categories for which some information is given in Table (4). The ratio of applicants to effective placements increased in practically all categories except in "others." The greatest relative increase occurred among those seeking "educational," "clerical" and "unskilled" jobs. In 1957 there was only one effective placement for 36 applicants seeking educational posts; and one for 75 seeking clerical or unskilled jobs. It is clear that the size of the second plan was not big enough to absorb the fresh seekers of employment who joined the labour force through the growth of population. A much bigger plan is essential to get rid of the fear of unemployment.

5.3. In my Anniversary Address last year I gave some information on unemployment and underemployment obtained through the National Sample Survey. I explained the difficulties of measuring underemployment and stated that there was scarcely any doubt that 10 or 12 million persons in India were unemployed or severely underemployed and that this figure might rise to even 25 or 30 million if consideration is extended to those who were sitting idle for more than half of their normal working time. I had drawn attention to the fact that about 10 per cent of educated persons (matriculates and above) were probably unemployed, and that this number was likely to rise. The evidence from Labour Exchanges would seem broadly to corroborate this.

5.4. It is clear that the Second Five Year Plan has not succeeded in absorbing, in sufficiently large numbers, the new seekers of employment. It is also likely that unemployment is continuing to increase among educated persons especially in urban areas. This is a disturbing sign. The only conclusion to be drawn is that the Third Five Year Plan must be much bigger in size than the Second Five Year Plan. It would be remembered that in the Second Five Year Plan it was visualized that net investments should reach Rs. 9900 crores in the Third Plan. Let us round off the figure, and adopt Rs. 10,000 crores as the target for investment in the Third Five Year Plan.

## HEALTH

6.1. Health, education and research have indeed a dual role. These are no doubt significant constituents of the level of living and, in this sense, are fruits of national development. On the other hand, advance of health, education and research are of basic importance in bringing about industrial and social progress. I shall first consider health.

6.2. In India at present there are about 70,000 physicians of whom a little less than a half are trained at the University level and about 37,000 are licenciates

with four-year training in junior medical schools. The distribution of doctors by level and qualification and state of residence in 1954 is given in Table (6). The number of doctors in India as a whole is about 176 per million of population or one physician for about 5700 persons on an average. The number however varies widely from one state to another, from over 600 per million (one doctor for 1700 persons) in West Bengal and Delhi to 40 per million (or one for 25,000) in Rajasthan and Manipur. What is, however, much more serious is that most of the doctors reside in urban areas; and the total number of doctors residing in rural areas (with a population of about 330 million) may be below 10,000 that is, only one doctor for 30,000 persons or more on an average. In some rural areas it is known that there is only one qualified doctor for 50,000 or 100,000 persons.

6.3. An important committee on health and medical care (popularly known as the Bhore Committee from the name of its Chairman) stated in the foreword to its report submitted in 1946 that "no individual should fail to secure adequate medical care because of inability to pay for it." This Committee had prepared a long-term programme most of which still remains unimplemented.

6.4. There is no difference of opinion regarding the desirability of providing medical care to all who need it. In India, unfortunately, in some respects we are still at the stage of a somewhat superficial imitation of the most advanced countries of Europe and America. Junior medical schools were abolished after independence on the view that our countrymen cannot be allowed to have anything less than the best. And yet to provide a sufficient number of university trained doctors and adequate hospital and medical services upto the standard of the rich countries of the world is absolutely impossible at present.

6.5. Doctors and drugs are both extremely scarce in India. Doctor's fees and the price of drugs are also high which keep these beyond the reach of most people. The extreme inequality in the distribution of expenditure on medicine and medical services can be appreciated from the relative share of expenditure on these items, shown below (and also from the Chart in the Appendix) for the bottom ten per cent, the lower half, and the top ten per cent of all households.

per cent of households		cumulative percentage of expenditure on			
		medical services		medicine	
		USA <sup>1</sup> 1950	India <sup>3</sup> 1955	India <sup>2</sup> 1952	India <sup>3</sup> 1955
(1)		(2)	(3)	(4)	(5)
per cent share of expenditure*					
bottom	10 per cent	5	0.1	1	1
(lower half)	50 "	37	6	9	8
top	10 "	19	64	45	56

<sup>1</sup> USA 1950 : Studies on Consumer Expenditure, 1950, Vol. VIII (University of Pennsylvania).

<sup>2</sup> India 1952 : National Sample Survey : 4th Round; April-September 1952: All-India (Urban).

<sup>3</sup> India 1955 : National Sample Survey : 9th Round; May-November 1955 : All-India (Rural).

\*Note : The classification is by size of income of households for the USA 1950 data; by size of expenditure of households for the India 1952 data; and by size of expenditure of persons for the India 1955 data. The American and Indian results are therefore not comparable in a completely rigorous way but the broad picture is clear. The expenditure on both medicine and medical services are far more concentrated in India showing that it is only the very few rich who can afford to pay for medicine and medical services. The two series for India 1955 have been, however, classified in the same way; and show that the distribution of expenditure on medical services is relatively more concentrated, that is, medical services are even more scarce than medicine in rural areas of India.

6.6. The above Table gives some similar figures for urban areas in U.S.A. in 1950. Looking at the first line of the table it is seen that the bottom ten per cent of American households share five per cent of the total expenditure on medical services incurred by all households; the corresponding share of the bottom ten per cent of rural households in India is negligibly small and only about 0.1 per cent. From the second line it is noticed that the lower half of American households share 37 per cent of the total expenditure while the Indian households share only 6 per cent of the total. We may also look at the top. Ten per cent of the households at the top in America take a share of 19 per cent of the total while the corresponding Indian households at the top have 64 per cent or nearly two-thirds of the total expenditure on medical services. The position is almost as bad in the case of medicine. In India the lower half of rural households share only 8 per cent of the total expenditure on drugs,<sup>1</sup> the corresponding figure for urban households being 9 per cent.

6.7. It may be pointed out, at this stage, that in countries with free and universal health services like U.K. and U.S.S.R. every person, in principle, receives essential medical services and medicine. In both countries, as private medical practice is permitted and drugs can be purchased in the market, some medical expenditure may be incurred by the rich on their own, but there is no discrimination between the rich and the poor so far as the national health services are concerned. In all other advanced countries medical care is available to the poor either free of charge or at a very small cost.

6.8. I should like to make a few suggestions for consideration for the Third Five Year Plan. Firstly, I think it would be wise to reintroduce training extending over, say, 3 years for a junior type of doctor or auxiliary health worker who would be prepared to serve in villages for a modest allowance of say something like Rs. 1,000 per year with permission for private practice within certain limits. The training cost would be possibly one-fourth or one-fifth of that of a fully qualified doctor. The pay or allowance would also be one-fifth or even less of the pay which would have to be given to a university level doctor. The cost of training and maintaining a junior doctor may be thus five times cheaper.

6.9. The organisation of medical teaching at a junior level would also be feasible on a much larger scale than at the university level. There are about 400 district hospitals, which, with some additional facilities, can serve as training centres for junior doctors; and which on an average, may be able to turn out 25 trained persons each per year which would supply 10,000 junior doctors per year after the scheme is in full operation. This would make it possible to have, say, one junior doctor for a group of ten villages in roughly half a million villages in eight or ten years. One fully qualified doctor may be placed in charge of about five junior doctors; and should be able to give some attention to the more difficult cases.

6.10. The cost of providing hospital and other health services would also have to be brought down to a level which the country can afford. The cost of construction of buildings can and should be lowered very appreciably firstly by adopting standards and specifications which would be appropriate for a poor country like India; and, secondly, by improving the efficiency of public construction.

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<sup>1</sup> Similar figures for the distribution of consumer expenditure on other items like foodgrains, all food items, cloth, sugar, education, and medical services are given in Tables (12), (13) and (14) in the Appendix.

It is also necessary to develop rapidly the manufacture of drugs and medical goods, and also to establish factories for the manufacture of machinery for this purpose. There is, of course, need of more systematic research for a fuller exploitation of our own natural resources for medical and health purposes.

6.11. Finally, it seems to me it would be very wise to initiate a truly national health service, even if this be in a skeletal form, during the third plan period. The emphasis in the first instance should be on establishing a large number of small village units which would provide essential medical and health service to the villages and also serve as family planning centres. This is the only way in which there would be any real chance of promoting birth-control effectively. This is a matter of great importance and urgency.

## EDUCATION

7.1. India is backward in education generally. Some comparative information is given in Table (7) for selected countries. In most advanced countries there is practically no illiteracy; and in China also the position is improving rapidly. India is still far off from universal and compulsory primary education. In India the number of illiterates (including both males and females) was 83.5 per cent of the population according to the Census of 1951. The National Sample Survey indicated that there was only a slight reduction of illiteracy to 82.5 per cent of the population as a whole in 1955. The number of students in primary schools in India was about 60 per 1000 of population in 1956 against 87 in China in 1955, 144 in Japan in 1956, 125 in U.S.S.R., and 154 in U.S.A.

7.2. The position is quite different at the secondary level. India had 23 students per 1000 of population at the secondary level in 1956 which was three times higher than the corresponding figure 7.4 in China in 1955. Also, the Indian figure does not compare too badly with 38 in U.S.S.R. in 1957-58 or 48 in U.S.A. in 1955. The number of students in the university and equivalent levels in India is remarkably high with a rate of 1.8 per 1000 of population which can compare favourably with 0.5 in China, 1.6 in U.K., or 2.5 in West Germany and 3.5 in France.

7.3. This structural difference in education comes out even more clearly if we adopt the number of primary students as the base for comparison. For every thousand students in the primary stage, India had about 384 at the secondary level in 1956 which was much higher than the corresponding proportion of 84 in China, and also higher than the proportions in France (264), U.S.S.R. (300), and U.S.A. (312). The number of students in the university and equivalent levels per thousand students in the primary level is also very high in India and was about 30 against 5 or 6 in China, 15 in U.K., 26 in West Germany, 31 in France and 47 in Japan. Only U.S.A. and U.S.S.R. have higher proportions.

7.4. The above comparisons bring out several points. India is weakest at the primary level and is far behind China and all advanced countries of the world. India has a much stronger position at the secondary level on a population basis. If, however, the number of primary students is used as the base for comparison then India has proportionately larger numbers in the secondary schools than most advanced countries of the world including U.S.A. and U.S.S.R. At the university and equivalent levels, also, India has a higher proportion of students than U.K., and has a proportion of the same order as Germany or France



on the basis broadly of both population and of the number of students at the primary level.

7.5. It is important to note that higher education in India has been expanding quite rapidly in recent years. Some relevant information is given in Table (9) which shows the enrolment of students by level of education, subjects, and sex in 1950-51 and 1956-57. It can be seen from this table that the total enrolment at higher levels (from intermediate to post-graduate and equivalent courses) was about 400,000 in 1951 and increased to about 780,000 in 1956-57, that is, the number had almost doubled in six years. It can be further noted that the largest increase had taken place at the intermediate level. On the whole, there was relatively greater expansion in arts, commerce and law compared to science and technology including medicine and veterinaries.

7.6. The outturn of qualified persons in India, at intermediate and higher levels, also showed a large increase and, more or less, kept pace with the increase in enrolment. Relevant data for the period 1951-1956 are given in Table (9) in the Appendix. There was, however, a good deal of wastage. On the whole, only about half the candidates who appeared at the examinations at the higher (university and equivalent) levels succeeded in passing these examinations. The proportion of successful candidates was the lowest at the intermediate stage (between 42 and 46 per cent). Relevant figures on number and percentage of successful candidates are given in Table (10). Large percentages of failure give rise to much frustration and to much waste of time, money and effort.

7.7. Some interesting information can be obtained by examining the number of students in higher courses in proportion to the number of matriculates for which relevant statistics are given in Table (11). It can be noticed from this table that for every 10,000 students who matriculated in 1952, about 6,750 had enrolled for courses at the intermediate level in 1952-53 out of whom about 4,400 succeeded in passing the appropriate examinations at this level in 1954. The enrolment at the degree level was 3,319 in 1954-55, and the number receiving degrees two years later in 1956 was 2,364. The enrolment in post-graduate courses in 1956-57 was 1,552. It may be noted that for every 10,000 candidates who had matriculated in 1952 only 2,920 or less than 30 per cent took up courses in science and technical subjects at the intermediate level; and less than 12 per cent proceeded with courses in science, technology, agriculture, medicine and veterinary at the degree stage. Finally, only 156 or less than two per cent took post-graduate courses in science and technology. The educational base is poor for a rapid expansion of scientific and technical personnel at higher levels.

7.8. Higher education in India developed to a great extent in a somewhat imitative way on the British pattern. Social and economic conditions are however entirely different in India. Academic ideals which are realisable in the U.K. sometimes necessarily degenerate into superficial imitation and window dressing. Indian colleges often have very large numbers of students who are not adequately prepared for higher education. University and college teachers are poorly paid and are often obliged to do a good deal of part-time outside work. Classes are very big, and library and laboratory facilities are often poor. It is not surprising that conditions of work in the universities are not entirely satisfactory.

7.9. In the advanced countries of the world there are usually good opportunities for productive employment for the students who come out of universities and other higher institutions. In India the position is entirely different. Only a very small proportion receive vocational or professional training. A very large

number receive what is called general education which does not make them fit to undertake any particular productive work. As I have already mentioned, unemployment among educated persons in India is increasing. This is creating a great deal of frustration and discontent. The greatest weakness in India is the lack of an organic relation between the system of education and national needs for economic development.

7.10. A radical reform of the educational system is a most urgent next step in planning. It is necessary, to turn out an increasing number of suitably trained personnel to meet the increasing demands of an expanding economy. The first thing in education must therefore be to give appropriate vocational and professional training which would make graduates of higher educational institutions qualified to undertake productive work of one kind or another. This is not in any way incompatible with what is called general culture. In fact, the two can very well go together. Dr. Zakir Hussain in his Patel Memorial Lectures he recently given a most illuminating exposition of this theme.

### PLANNING FOR SOCIALISM

8.1. At this stage it is desirable to recall that in India socialism has been declared to be the goal of economic policy. It is quite proper not to try to give any rigid definition. And yet it is essential to have some clear understanding in this matter as a guide to action. In U.S.S.R., China and other countries in which socialism of one form or another has been already established, planning is considered to be an essential requirement for economic and social progress; and the aims and objectives of planning are settled in accordance with the principles of socialism in the accepted form. In other words planning in the socialized countries is an instrument of socialism. In India the position is different. Socialism has been accepted as the aim but has not yet been established. It is, therefore, important to examine the relation between planning and socialism.

8.2. Many different ideas have been associated with the concept of socialism in different countries and at different times. I shall select three ideas which have special relevance to our problems. The first is rapid economic development through full utilization of the resources of the country. This was the object for which planning was established in India and should continue to receive full attention. The second idea I should like to mention is removing progressively large disparities in wealth, income, and power; and the third is fostering equality of opportunities of all kinds for all the people of India.

8.3. The distribution of wealth, income and privileges is extremely unequal in India. The number of persons who pay income-tax is of the order of five lakhs or half a million.<sup>1</sup> Multiplying by five, (which is the average number of persons per household) the total number of persons in families paying income-tax would be about 2.5 million out of a population of nearly 400 million or appreciably less than one per cent. The class which has some money and influence in India is thus extremely small and possibly forms not more than one or two per cent of the whole population. Facilities for education being both scarce and expensive, higher education is probably almost a monopoly of this privileged class at the top.

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<sup>1</sup> The actual number depends on the level of income at which income-tax becomes chargeable; this level has fluctuated between Rs. 2500 and Rs. 4200 per year in recent years.

The inequality in the distribution of expenditure on educational services can be seen from the accompanying Chart and Table (14) in the Appendix. The bottom 10 per cent of rural households in India have a share of less than one per cent of the total educational expenditure and the lower half (50 per cent) of households shared 11 per cent only; while the top 10 per cent have as much as 36 per cent. Many poor people do not get even the opportunity to learn how to read and write. Many who complete the primary stage cannot join secondary schools; many who complete the secondary stage are unable to go to institutions of higher education on account of poverty. The same process of selection, on the basis of the income of the parents, continues at all levels of higher education. Finally it is only the rich people who can send their children abroad for higher training and education.

8.4. Inequalities in medical care result in a larger number of deaths among the poor people. Inequalities in educational opportunities have a deeper and more pervasive effect. It is true that some extremely able students succeed in securing scholarships upto the highest level but their number is very small. By and large, it is the rich people who have the opportunity of giving their children the type of education required for posts of influence and responsibility in the country. By and large, those having such training are selected for posts of responsibility on the strength of their higher educational qualifications. In this way the power and privileges of a small group of people at the top tend to be not only preserved but strengthened. In both public services and organized private enterprises practically all posts of influence and power are held by persons belonging to the same small privileged class. This has created an influential group of people who naturally desire to maintain their privileged position and power. During the British period many of the influential people were not enthusiastic about the political change because they were afraid of losing their own privileges. In the same way it is not surprising that there are people in India today who are not enthusiastic about a rapid economic progress out of a similar fear of losing their privileges and power. It is necessary to remove barriers to educational opportunities to overcome such difficulties. This is the only way in which a sound foundation can be laid for democracy and socialism in India.

### EDUCATIONAL REFORM

9.1. The only real remedy is to make education entirely free and also to ensure that no deserving student would be deprived of educational opportunities on account of poverty. It is no doubt necessary and desirable to do this at all levels of education; but it may be too difficult a task to undertake immediately. As a first step, it is suggested, that this reform should be carried through at the university and equivalent levels during the period of the Third Five Year Plan. This would call for several types of action. Firstly, all fees at the university level would have to be abolished by increasing the direct contribution from Government by an equal amount. Secondly, enough financial assistance would have to be provided by Government to enable every deserving student being maintained during the whole period of his study in higher educational institutions. Thirdly, selection for admission to higher education would have to be made entirely on merit. Fourthly, it would be desirable to institute evening classes, correspondence courses, and external examinations on a large scale to provide opportunities for higher education to those who are unable to attend the day-classes and also to maintain a policy of open door as a safeguard against rigidities and defects which may develop within a strictly controlled system of admissions. Finally, it would be desirable to initiate a scheme for constructive work for the nation which would be obligatory for one or two years for

all students who are admitted to higher educational institutions or who graduate from such institutions. This is not the occasion to give any detailed scheme but it may be useful briefly to consider some of the implications of the above proposals.

9.2. We have seen that total enrolment in higher education had nearly doubled in six years and was about 780,000 in 1956-57. The direct expenditure on higher education was about Rs. 293 million (Rs. 29.3 crores), out of which about 42 per cent or Rs. 120 million (Rs. 12 crores) came from students' fees.<sup>1</sup> The number of students during the Third Plan period would no doubt be higher. If expansion continued at about the same rate, the number in the middle of the Third Plan period may reach a million and a half. It may not be however necessary or desirable to allow such an increase in future, and we may provisionally accept a target of one million students in higher education in the Third Plan but also keep in mind a million and a half. For one million students, the Government grant in lieu of fees would come to about Rs. 16 crores, and for a million and a half to about Rs. 24 crores per year at current rates and prices.

9.3. As regards financial assistance for maintenance, at the rate of Rs. 300 or Rs. 400 per year per student on an average, the cost would come to Rs. 30 or Rs. 40 crores per year for one million students. I have used average figures because it would be quite reasonable to adopt something like a "means test" so that the amount of the stipend would depend on what assistance the parent would need to maintain the student without any strain. Secondly, stipends of a larger amount may be offered as incentives to attract students to science and technology or other suitable subjects and also to post-graduate courses. The total cost may be of the order of Rs. 50 or Rs. 60 crores per year. If the Third Plan succeeds in raising the national income by five per cent per year (and this is about the lowest safe limit) then the additional income generated would be at least of the order of Rs. 600 crores per year or more out of which there should not be any difficulty in providing the above expenditure.<sup>2</sup>

9.4. Selection for admissions on merit is indeed a formidable task, but I venture to think it is not beyond our capacity if we call science to our aid. The objects of the admission test must be clearly defined, and attempts must be made to maintain uniform standards throughout the country. I shall make a few suggestions to serve as a basis for further discussions. It may be desirable to try to assess such aspects of the candidate's qualifications, for example, as (a) his content of knowledge in appropriate subjects, (b) his ability to search and compile relevant information from books and written materials, (c) his capacity to organize his knowledge and convey his ideas in a clear way in a written form, or (d) his skill in manual or technical work or ability to make scientific observations

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<sup>1</sup> Compared to a fee income of 42 per cent of the total expenditure in India the income from fees at the university level is less than 11 per cent in U.K. and is about 8 per cent in the land-grant institutions many of which are the great State universities of U.S.A.

<sup>2</sup> It is appropriate at this stage to point out that the proposals to abolish all fees in higher education and to award maintenance stipends out of government funds would merely involve a redistribution of the national income; and should not, in principle, cause any additional strain on the economy as a whole. It would be necessary, of course, for Government to raise the required amount through additional taxation or in other ways. But, in principle, the amount which was being spent by the parents of the students would be set free and would be available for either savings or consumption. In other words, there would be no additional call on physical resources.

or experiments. These are all amenable to assessment on a more or less objective basis. For example, modern objective tests, in which a candidate has only to indicate his choice between different alternative answers, can be used in testing knowledge in a standardised manner throughout the country. The ability to compile and collect information from given books and materials can also be standardised at different levels of difficulty. The ability to convey in a coherent form his knowledge and ideas can be tested by asking the candidate to prepare written notes on the basis of material given to him or to be collected by him from given books and papers. His power of expression can be tested by the usual type of free essay for which several hours can be allotted. Some kind of practical work or experiments can also be made a part of the examination.

9.5. I should like to mention that, in my opinion, modern statistical methods can be used very effectively to select a required number of questions for any particular paper out of a given "universe of questions" in a random manner and at the same time to maintain assigned levels of difficulty and subject coverage within prescribed limits with objective certainty. This would have two advantages. It would enable uniform standards being maintained throughout the country and from year to year. It would also permit almost infinite variations in the content of individual question papers so that copying from an answer book can be made practically impossible. Furthermore, with the help of modern electronic computers it would be possible to mark the objective type of papers very quickly and accurately.

9.6. I may also explain that the test for admission need not be one single examination but may very well be different examinations for different groups of subjects. For each examination it would be, however, necessary to maintain as uniform standards as possible over the whole country. To maintain parity or equivalence of standards between different examinations would be technically a more difficult task. However in principle, it is not absolutely necessary that the quality of the candidates should be the same in all subjects. If there is greater competition in certain subjects it is likely that such subjects would attract candidates of a higher quality on an average. This need not be prevented.

9.7. One great advantage of the proposed system would be that it would be possible to regulate admissions to particular subjects in accordance with social needs and opportunities of employment which are likely to be available to the students after graduation. In this way admission to higher education would be geared to future requirements of trained manpower.

9.8. It would be of advantage in many ways to institute evening classes, correspondence courses and external examinations to offer fuller opportunities for higher education. Correspondence courses are being used very extensively in U.S.S.R. apparently with great success; and it would be possible to take advantage of Soviet experience. Arrangements may have to be made for laboratory or other institutional work for prescribed periods or during vacations. All this would, of course, call for much organizational effort and experimentation which would offer scope for much employment of persons with higher education. A standard system of external examinations (including practical work or tests as necessary) would keep the door open for every one and would be a safeguard against abuses developing within a closed system.

## NATIONAL SERVICE

10.1. If the State undertakes to make education available at its own expense to all deserving students then it would be entirely proper to ask the students to undertake productive and constructive work for the country for one or two years. The maintenance stipend would be continued or can be increased in suitable cases during this period. In many countries of the world a period of service in the armed forces is compulsory. In India, instead of conscripted service in the defence forces, we may think of a period of obligatory service in peace camps or in a peace force for constructive work.

10.2. It would be probably convenient to ask the students to put in their prescribed period of service immediately after their graduation. This would supply every year a large number of highly trained persons who would be able to undertake productive work of various kinds. This would be of direct gain to the nation. For example, it would be possible to use a large number of such students to do teaching work at different levels all over the country. The medical graduates can help in bringing medical care to the villages. For the trainee himself it would be a valuable period of apprenticeship training, something like the "internee" work in hospitals by medical graduates, and would be of help in their finding employment suited to their training and aptitudes. The most valuable aspect of the peace camps or peace forces, if I may use this phrase, would be the bringing together of young persons from widely differing types of families in a comradeship of active work for the country. This would be an effective way of promoting the spirit of democracy.

10.3. Although I have spoken of students joining the peace camps or the peace force after graduation from higher institutions of education it is also possible to have "work schools", as Dr. Zakir Hussain has called them, for students before they come to the University. In U.S.S.R. a new policy has been adopted of asking all students to work for at least two years from the age of 15 before they are admitted to institutions of higher education. Various possibilities are thus open. The really important point is to accept the principle that a prescribed period of service in a peace force for say two years at some stage or other would be an obligatory requirement for all educated persons.

## SCIENCE AND RESEARCH

11.1. The importance of science and technology for national development has been recognised in India, in principle, since independence. It cannot be said, however, that progress has been entirely adequate or satisfactory. There is urgent need of improving the teaching of science at all levels. Much improvement is also needed in the organization of research. There is no time to make a comprehensive review, and I shall make some brief observations on some selected aspects of the problem.

11.2. Science is developing so fast that it is becoming increasingly difficult for teaching to keep pace with the advancement of knowledge. J. D. Bernal has recently pointed out that:

"With a rapidly growing civilization, the young will year by year have more to know and also, will be required, by the new demands made on them, to know

more. . . Something must be done to simplify and reduce the amount of learning at every stage. . . In the past with some reason, teaching was considered to be the passing on of known and established truths from one generation to the next. . . But clearly, in a civilization where the whole basis of knowledge is expected to change several times in a generation, the passing on of established knowledge becomes palpably inadequate and, also, from its ever increasing bulk, impossible. It is lucky if most of what is taught is true, or supposed to be true, at the time it is taught. It is certain that it will no longer be considered true by the time those who are taught are half-way through their lives. What is needed, therefore is a different and lightened content of education. The emphasis will be on discovery rather than knowledge. It will be, not so much the passing on the established truths, as showing the way to criticize and discover new truths; in other words, the active part of the scientific method."<sup>1</sup>

11.3. Some serious thinking has been going on for some time in the Indian Statistical Institute on organizing an integrated course of science teaching in which emphasis would be given to develop the student's skill in observation, counting, measurement, logical analysis and interpretation of the facts, and the design of new experiments to test the working hypothesis. One single set of observations and experiments may cover different branches of science, which, it is hoped, may give an integrated outlook on scientific method. It is no longer possible to have encyclopaedic coverage of knowledge. The only possibility is to try to make an intensive and integrated study which would touch particular aspects of different branches of science. I have no time to elaborate these thoughts but it seems to me that it will be well worth making some experiments in this direction.

11.4. It is essential to spread the teaching of science extensively at the school level without which it will be never possible to secure a sound foundation for advancement of science in India. Sir Alexander Fleck, in his presidential address to the British Association for the Advancement of Science in 1958 mentioned that in U.S.S.R. children from 11 to 17 years devote 46 per cent of their school time to science subjects. I am aware that it is not possible to approach this level immediately in India but we should keep some such target in view. Teaching of science, both in schools and universities, deserves serious attention by senior scientists.

11.5. As regards the organization of science in its wider sense, I have on other occasions pointed out that our own National Institute of Sciences is not very active. Our Institute is supposed to have the responsibility of advising Government on scientific matters. In practice there is very little activity of this kind. This I think is partly due to lack of clear ideas regarding what should be the proper function of scientific societies in the changing conditions of the present time; and also, I am sorry to say, partly due to lack of a sense of responsibility on our own part. I have made some suggestions in my Annual Review in 1958 and need not say anything more on the present occasion.

11.6. I am a strong advocate of the public sector but this, in my view, does not mean concentrating all activities in government departments. On the contrary, in the scientific field, I think it is essential to build up and maintain truly independent scientific organizations which would be in a position to offer advice and constructive criticisms and suggestions to Government. I have already

mentioned that we ourselves have not been sufficiently serious regarding our own responsibilities. But I also think that the time has come for Government to give serious attention to the future structure of scientific organization and research in India not only within government but for the country as a whole.

11.7. If I may put it in this way, the solution does not lie in officialising all scientific activities but gradually to make the scientific organizations truly functional by transferring to them real responsibilities and entrusting them with fruitful activities. The advancement of science requires proper recognition of scientists in the structure of society as a whole. In this connexion I may remind you that Sir Alexander Fleck has given a quotation from an administrator which went on record that "the place of the expert is not in the saddle but as the assistant and the adviser, The scientist must be on tap, not on top." I can only say that the future of India depends on reversing the dictum of the administrator and recognising that the scientist must be on top and not merely on tap. I have a deep conviction that scientists must supply the leadership in national development. It is necessary that they should take the initiative.



# NEXT STEPS IN PLANNING

## Appendix

### STATISTICAL TABLES

TABLE (1): SOME CHARACTERISTICS OF DEVELOPMENT FOR SELECTED COUNTRIES

country	year	popula- tion in million (10 <sup>6</sup> )	steel pro- duction in million metric tons per year	per capita national income US dollars	physicians per ten thousand of popu- lation	school children percent of popu- lation
(1)	(2)	(3)	(4)	(5)	(6)	(7)
level of one million ton of steel per year						
1. USA	1880	50	1.3	635	16.3	19
2. UK	1880	31	1.3	385	6.6	12
3. Germany	1885	48	1.2	340	3.6	15
4. France	1895	39	0.9	485	3.9	14
5. Russia	1895	105	0.9	95	1.6	3
6. Japan	1923	56	1.0	125	7.7	17
7. India	1955-56	384	1.3	60	1.7	0.8
level of 4 or 5 million tons of steel per year						
1. USA	1890	63	4.3	735	15.9	20
2. UK	1900	38	5.0	560	8.8	16
3. Germany	1895	54	4.0	430	4.0	17
4. France	1913	39	4.7	550	5.3	14
5. USSR	1929	147	4.0	95	4.3	8
6. Japan	1935	69	4.9	195	8.4	17
7. China	1956	608	4.5	70	1.2	1.6
8. India	1960-61	408	4.3	72	2.1	1.0

Compiled by the Planning Division, Indian Statistical Institute.

#### Notes on Table (1)

1. Figures of steel output are taken from Woytinsky and Woytinsky: *World Population and Production*, for all countries except China and India. Chinese and Indian figures relate to finished steel and are respectively taken from *China To-day*, 25 August, 1957, and *Second Five Year Plan*, 1956 (India).

2. For USA, UK and Japan, population figures are taken from the Statistical Abstracts of the respective countries relating to different years. Figures for Germany and France are obtained by interpolation from data given by Woytinsky and Woytinsky. Russian data relating to 1895 are obtained in the same manner while the figure for 1926 is from the *National Economy of USSR*. Chinese data are from unpublished official Chinese sources; and Indian data from the *Second Five Year Plan*.

3. Data on number of school children for USA, Germany, UK and Russia are taken from the *Encyclopaedia of Social Reform* and Mulhall, *Dictionary of Statistics*. French data relating to 1895 is from the *Statistical Year Book: National Institute of Statistical and Economic Studies*, France, while for 1912-13, are from the *International Year Book of Statistics*, 1920. Data for USSR and India are from sources given in (2). The figure for Japan is based on the *Statistical Abstract of Japan, 1933* and the *UN Statistical Year Book*. The Chinese figure is from the *Report on Fulfilment of the National Economic Plan in 1955*.

4. The US figures for doctors are from the *Historical Statistics of USA* while those for UK are from the *Professions* by Carr-Saunders and Wilson. French data are obtained from Woytinsky and Woytinsky. The German and Russian figures are from Mulhall, *Dictionary of Statistics* and Woytinsky and Woytinsky, *World Population and Production* while the figure for USSR is from *40 years of Soviet Power*. The Japanese figures are from the *Statistical Abstract of Japan, 1933* and the *UN Statistical Year Book, 1949-50*. Indian and Chinese data are from sources indicated in (3).

5. National income figures are roughly dimensional and are obtained from certain estimates at current dollars for 1955 or 1956 carried backward by index numbers of real per capita income. Some of these current estimates were considered in the Science and National Planning, *Sankhyā*, September, 1958.

The index numbers used for USA are taken from data given in the *Economic Report of the President, 1957*; and the "Long-term Change in the National Income of the USA since 1870" by Simon Kuznets, (*Income and Wealth*, Series II). The German figure is adjusted by series available in the *Statistics of National Income and Expenditure*, (UN Statistical Papers, Series H), and the "Long-term Growth of National Income in Germany" by P. Jostock, (*Income and Wealth*, Series V). For the UK estimates, use has been made of data given by Prest, National Income of the UK, (*Economic Journal*, March 1948); Phyllis Dean, Contemporary Estimates of National Income.....Nineteenth Century (*Economic History Review*, vol. 8, no. 3 and vol. 9, no. 3); the *Statistics of National Income and Expenditure (UN)* and *UN Statistical Year Book*. The French figures are obtained on the basis of UN sources indicated above and a series of real output per working person given in Colin Clark: *Conditions of Economic Progress*. The figure for Japan is adjusted by data given in the *Japanese Statistical Year Book, 1957* while Chinese and Indian data relating to current period are taken from official sources.

#### Notes on Table (2)

##### List A (developed countries) :

(1) Australia, (2) Austria, (3) Belgium, (4) Canada, (5) Denmark, (6) France, (7) Federal Republic of Germany, (8) Finland, (9) Iceland, (10) Italy, (11) Luxembourg, (12) Netherlands, (13) New Zealand, (14) Norway, (15) Sweden, (16) Switzerland, (17) South Africa, (18) UK, (19) USA.

##### List B (socialized countries) :

(1) Albania, (2) Bulgaria, (3) Czechoslovakia, (4) China, (5) German Democratic Republic, (6) Hungary, (7) Poland, (8) Rumania, (9) USSR, (10) Yugoslavia.

##### List C (medium developed countries) :

(1) Argentina, (2) Bolivia, (3) Brazil, (4) Costa Rica, (5) Cuba, (6) Chile, (7) Columbia, (8) Dominican Republic, (9) El-salvador, (10) Ecuador, (11) Greece, (12) Guatemala, (13) Haiti, (14) Honduras, (15) Ireland, (16) Japan, (17) Jamaica, (18) Mexico, (19) Portugal, (20) Paraguay, (21) Peru, (22) Panama, (23) Puerto Rico, (24) Spain, (25) Turkey, (26) Uruguay, (27) Venezuela.

##### List D (underdeveloped countries) :

(1) Afghanistan, (2) Algeria, (3) Angola, (4) Burma, (5) Belgian Congo, (6) China, (7) Ceylon, (9) Cameroon, (9) Egypt, (10) Ethiopia, (11) French West Africa, (12) Ghana, (13) Hongkong, (14) India, (15) Indonesia, (16) Iran, (17) Iraq, (18) Israel, (19) Kenya, (20) Lebanon, (21) Liberia, (22) Malay, (23) Morocco, (24) Mauritius, (25) Mozambique, (26) Madagascar, (27) Nigeria, (28) Pakistan, (29) Philippines, (30) Rhodesia and Nyasaland, (31) Saudi Arabia, (32) South Korea, (33) Syria, (34) Thailand, (35) Taiwan, (36) Tunisia, (37) Tanganayika, (38) Uganda, (39) Vietnam, (40) Yemen.

##### Sources :

Columns (2), (4), (5), (9) and (10) are from the *UN Statistical Year Book, 1956*.

The Chinese population figure is taken from statistics prepared by the State Statistical Bureau of the People's Republic of China (in Chinese). The Chinese figures for physicians and primary school students are from the statistics prepared by the State Statistical Bureau of the People's Republic of China.

The USSR figures for physicians and primary school students are from the data supplied by the Central Board of Statistics of the USSR.

The method of estimation of national income figures is explained generally in *Sankhyā*, vol. 20 parts 1 and 2, "Science and National Planning".

TABLE (2) : POPULATION, NATIONAL INCOME, PRODUCTION OF STEEL AND ELECTRICITY, AND NUMBER OF PHYSICIANS AND PRIMARY SCHOOL STUDENTS BY COUNTRIES AND GROUPS OF COUNTRIES ABOUT 1955-56

countries	popula- tion in millions (10 <sup>6</sup> )	national income in US dollar billion (10 <sup>9</sup> )	production		national income in US dollar	per capita		physicians per ten thousand of popula- tion	primary school pupils per thousand of popula- tion
			crude steel in million (10 <sup>6</sup> ) metric tons	electri- city billion (10 <sup>9</sup> ) kwh		production	crude steel (kg)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. United States of America	165	341	106	629	2030	642	3812	13.2	158
2. United Kingdom	50	46	20	94	900	394	1846	16.7	108
3. Developed (sub-total) <sup>1</sup>	450	566	191	1107	1292	436	2527	11.5	132
4. USSR	200	200	45	170	1000	226	850	14.9	65
5. China	620	44	3	12	72	4.8	20	1.2	87
6. Socialized (sub-total) <sup>2</sup>	900	278	63	298	317	72	340	5.9	90
7. Japan	90	21	10	65	230	105	724	10.5	144
8. Medium (sub-total) <sup>3</sup>	350	86	13	120	259	38	360	7.3	116
9. India	380	23	2	8	61	4.5	21	1.8	54
10. Underdeveloped (sub-total), excluding China	900	71	2	25	80	2	28	1.4	65
11. Underdeveloped including China <sup>4</sup>	1500	114	5	37	76	3	25	1.3	74
12. World [3+6+8+10] total	2600	1002	269	1550	395	106	611	5.5	92

Compiled by the Planning Division, Indian Statistical Institute. Population and other figures have been rounded off dimensionally.

<sup>1</sup> Includes developed countries in North America, Europe, Australia (as in list A).

<sup>2</sup> Includes all socialized countries (as in list B).

<sup>3</sup> Includes Japan and medium developed countries in Europe and Latin America (as in list C).

<sup>4</sup> Includes underdeveloped countries in Asia and Africa (as in list D)

TABLE (3): OUTPUT OF CRUDE STEEL IN MILLION METRIC TONS<sup>1</sup> FOR WORLD AND SELECTED COUNTRIES

year	World <sup>2</sup>	United Kingdom	United States	Germany	USSR	Japan <sup>6</sup>	China	India
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1870	0.7	0.2	f <sup>3</sup>	0.2	f			
1880	4.4	1.3	1.3	0.7	0.3			
1890	12.4	3.6	4.3	2.2	0.4			
1900	28.3	5.0	10.4	6.6	2.2			
1910	60.5	6.5	26.5	13.7	3.5			
1913	76.5	7.8	31.8	18.9	4.8	0.2		f
1918	73.6	9.7	45.2	15.0	0.4	0.8		0.2
1923	78.5	8.6	45.7	6.3	0.6	1.0		0.2
1929	120.5	9.8	57.3	16.2	4.9	2.3		0.6
1932	50.7	5.3	13.9	5.7	5.9	2.4		0.61 <sup>10</sup>
1939	135.6	13.4	47.9	22.4	17.6	6.7	0.5	1.1
1940	142.9	13.2	60.8	19.0	18.3	6.9	0.6	1.3
1944	152.1	12.3	81.3	18.0	13.9	5.9	0.9 <sup>7</sup>	1.4
1945	113.3	12.0	72.3	0.3	12.3	2.1	n.a.	1.4
1950	188.7	16.6	87.8	12.1 <sup>4</sup>	27.3	4.8	0.2 <sup>8</sup>	1.5
1955	269.1	20.1	106.2	21.3	45.3	9.4	2.9	1.7
1956	282.6	21.0	104.5	23.2	48.6 <sup>5</sup>	11.1	4.5 <sup>9</sup>	1.8

<sup>1</sup> one metric ton = 1.1023 short tons.

<sup>6</sup> Includes Korea upto 1932.

<sup>2</sup> Excludes China upto 1932 and 1944-50.

<sup>7</sup> Relates to 1943.

<sup>3</sup> f = less than 100,000 tons.

<sup>8</sup> Relates to 1949.

<sup>4</sup> West Germany from 1950.

<sup>9</sup> China 1957 and 1958 figures are 5.3 and 11 million metric tons respectively.

<sup>5</sup> USSR 1957 and 1958 figures are 51 and 55 million metric tons respectively.

<sup>10</sup> Relates to 1932-33.

Compiled by the Planning Division, Indian Statistical Institute, from :

(a) Woytinsky and Woytinsky: *World Population and Production: Trends and Outlook* (New York, 1953).

(b) *United Nations Statistical Year Book, 1957.*

(c) D. G. Zhimerin: *Economy of the Soviet Union, Past and Present*, (Moscow, 1958).

(d) *News and Views from the Soviet Union*, (USSR Embassy, New Delhi, 18 December 1958).

(e) *China Today*: 25 September 1958; 10 January 1959.

(f) *Report on Fulfilment of the National Economic Plan of the People's Republic of China in 1955* (with Statistical Summary).

(g) Sastry: *A Statistical Study of India's Industrial Development.*

(h) *Statistical Abstract, India: 1927-28 to 1936-37.*

TABLE (4): INCREASE IN LIVE NUMBER ON LABOUR EXCHANGE REGISTERS IN INDIA IN 5 YEARS: 1953-1957

occupational category	number on live-register at end of month		increase in five years		monthly average of effective placements		ratio of applicants to effective placements <sup>1</sup>	
	January	December	number	percent	1953	1957		
	1953 (131)	1957 (181)						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. industrial supervisory	4,317	5,929	1,612	37.3	180	171	24.0	34.7
2. skilled and semiskilled	46,539	71,508	24,969	53.7	2,247	1,910	20.7	37.4
3. educational	6,625	40,246	33,621	507.5	401	1,117	16.5	36.0
4. clerical	113,424	267,757	154,333	136.1	2,006	3,594	56.5	74.5
5. domestic service	13,987	32,018	18,031	128.9	938	1,141	14.9	28.1
6. unskilled	221,761	460,639	238,878	107.7	8,452	6,178	26.2	74.6
7. others	27,775	44,002	16,227	58.4	1,230	1,958	22.6	22.5
8. all categories	434,428	922,099	487,671	112.3	15,454	16,069	28.1	57.4

<sup>1</sup> That is, col. (8) = col. (2)/col. (6); and col. (9) = col. (3)/col. (7).

TABLE (5): NUMBER ON LIVE REGISTER AND NUMBER OF VACANCIES AND REPLACEMENTS: LABOUR EXCHANGES IN INDIA, 1953-1957

all categories	year				
	1953	1954	1955	1956	1957
(1)	(2)	(3)	(4)	(5)	(6)
1. monthly average of effective placements	15,454	13,538	14,145	15,821	16,069
2. monthly average of vacancies notified	21,392	19,990	23,377	24,718	24,766
3. monthly average on Live Register	477,575	562,319	647,109	749,099	816,280
4. number of applicants per vacancy (row 3 ÷ row 2)	22.3	28.1	27.7	30.3	33.0
5. number of applicants per placement (row 3 ÷ row 1)	30.9	41.5	45.7	47.3	50.8

Compiled in the Indian Statistical Institute from "A Study of Trends in the Number of Employment Seekers in the Year 1953-1957." (Ministry of Labour & Employment, D.G.R. & E., September 1958).

TABLE (6) : DISTRIBUTION OF DOCTORS PER MILLION POPULATION BY LEVEL OF QUALIFICATIONS AND STATE OF RESIDENCE IN 1954

states	popula- tion 1954 (million)	number of doctors			doctors per million (10 <sup>6</sup> ) population			index with West Bengal = 100
		graduate and post- graduate	licen- tiate	all	graduate and post- graduate	licen- tiate	all	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. Andhra	32.65	2,025	1,908	3,933	62	58	120	19.8
2. Assam	9.59	403	2,281	2,684	42	238	280	46.3
3. Bihar	40.07	1,762	3,302	5,064	44	82	126	20.8
4. Bombay	51.15	6,928	6,044	12,972	135	118	253	41.8
5. Jammu & Kashmir	4.54	32	42	74	7	9	16	2.6
6. Kerala	14.51	836	845	1,681	58	58	116	19.2
7. Madhya Pradesh	26.80	731	1,191	1,922	28	44	72	11.9
8. Madras	31.38	2,959	3,083	6,042	95	98	193	31.9
9. Mysore	20.58	1,100	1,846	2,946	53	90	143	23.6
10. Orissa	14.94	448	800	1,248	30	54	84	13.9
11. Punjab	16.63	1,118	1,915	3,033	67	115	182	30.1
12. Rajasthan	16.74	213	454	667	13	27	40	6.6
13. Uttar Pradesh	65.60	3,244	2,989	6,233	49	46	95	15.7
14. West Bengal	27.41	6,157	10,434	16,591	225	381	605	100.0
15. Delhi	1.93	771	468	1,239	399	242	642	106.1
16. Himachal Pradesh	1.13	31	42	73	27	37	65	10.7
17. Manipur	0.60	3	21	24	5	35	40	6.6
18. Tripura	0.69	31	145	176	45	210	255	42.1
all India	376.94	28,792	37,810	66,602	76	100	176	29.1

Source : Perspective Planning Division, Planning Commission; based on Medical Registers.

TABLE (6.E) : INCOME AND EXPENDITURE OF UNIVERSITIES AND COLLEGES IN INDIA : 1955-56

type of instituion	recurring expen- diture (Rs. lakhs)	source of income (percentage)				type of expenditure (percentage)		
		govt. grants	fees	endow- ment	other <sub>s</sub>	salary	scholar- ship	others
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. university teaching	937	49	34	2	15	25	4	71
2. boards of education	132	1	97	—	2	—	—	100
3. professional colleges	700	67	23	3	7	48	14	38
4. general colleges	1040	34	56	3	7	62	14	24
5. intermediate colleges	125	39	39	7	15	68	22	9
6. total higher	2934	45	42	3	10	44	10	46
in Rs. lakhs	—	1320	1232			1291	293	

Source : Education in India, Vol. 1 1955-56.

TABLE (7): STRUCTURE OF EDUCATION: SELECTED COUNTRIES

level of education	USA 1955	USSR 1957-58	UK 1954	West Germany 1956	France 1954	Japan 1956	China 1955	India 1955-56
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. population (in millions)	165	200	51	51	43	90	608	384
number of students in thousands (000's)								
2. primary	25,458	25,055	5,484	4,955	4,921	12,956	53,126	22,899
3. secondary	7,961	7,511	2,483	3,668	1,300	8,063	4,473	8,789
4. higher	2,679	2,100	84	127	150	610	292	681
5. total	36,098	34,666	8,051	8,750	6,371	21,629	57,891	32,369
number of students per 1000 of population								
6. primary	154.3	125.3	107.5	97.2	114.0	144.4	87.4	59.6
7. secondary	48.2	37.6	48.7	71.9	30.2	89.6	7.4	22.9
8. higher	16.2	10.5	1.6	2.5	3.5	6.8	0.5	1.8
9. total	218.7	173.4	157.8	171.6	148.1	240.4	95.3	84.3
number of secondary and higher students per 1000 primary students								
10. secondary	312.7	299.8	452.8	740.3	264.2	622.3	84.2	383.8
11. higher	105.2	83.8	15.3	25.6	30.5	47.1	5.5	29.7
12. total	417.9	383.6	468.1	765.9	294.7	669.4	89.7	413.5
number of higher students per 1000 secondary students								
13. higher	336.5	279.6	33.8	34.6	115.4	75.7	65.3	77.5

Compiled by the Planning Division, Indian Statistical Institute from :

1. Population figures are taken from *UN Statistical Year Book* 1956 and 1957 except for China which is taken from official data (in Chinese).

2. Educational statistics are taken from the following sources :

USA : *Statistical Abstract of USA*, 1956 and 1957.

USSR : *USSR in Figures* (in Russian), 1958. Structural features of Soviet education are not fully revealed in recent data due to the fact that very few children were born during the war.

UK, West Germany, France and Japan : *UN Statistical Year Book*, 1957.

China : From *Report on Fulfilment of the National Economic Plan of the People's Republic of China* in 1955.

India : Basic Statistics relating to Indian Economy (mimeographed : CSO) for primary education; and *Education in India*, Vol. 1, 1955-56.

TABLE (8) : ENROLMENT OF STUDENTS BY LEVEL, SUBJECT AND SEX WITH PERCENTAGE :  
1950-51 AND 1956-57

level and subject (1)	1950-51						1956-57						index 1950-51 =100 (8)
	number (000)			percentage			number (000)			percentage			
	boys (2.1)	girls (3.1)	total (4.1)	boys (2.2)	girls (3.2)	total (4.2)	boys (5.1)	girls (6.1)	total (7.1)	boys (5.2)	girls (6.2)	total (7.2)	
1. <i>Intermediate</i>	198.6	24.4	223.0	89.1	10.9	100.0	381.2	59.5	440.7	86.5	13.5	100.0	198
2. arts	96.3	18.0	114.3	43.2	8.0	51.2	195.1	48.1	243.2	44.3	10.9	55.2	213
3. commerce	16.1	0.1	16.2	7.3	0.0	7.3	35.0	0.2	35.2	7.9	0.1	8.0	217
4. science	84.6	6.3	90.9	37.9	2.9	40.8	145.0	11.2	156.2	32.0	2.5	35.4	172
5. agriculture	1.6	—	1.6	0.7	—	0.7	6.1	—	6.1	1.4	—	1.4	381
6. <i>Diploma</i>	9.5	0.3	9.8	96.9	3.1	100.0	26.1	0.7	26.8	97.4	2.6	100.0	275
7. " engineering & technology	8.2	—	8.2	83.7	—	83.7	23.7	—	23.7	88.5	—	88.5	289
8. " others	1.3	0.3	1.6	13.2	3.1	16.3	2.4	0.7	3.1	8.9	2.6	11.5	194
9. <i>Degree</i>	130.4	15.0	145.4	89.7	10.3	100.0	236.7	38.4	275.1	86.0	14.0	100.0	189
10. arts	44.4	8.9	53.3	30.6	6.1	36.7	88.8	25.0	113.8	32.2	9.2	41.4	214
11. commerce	15.8	0.1	15.9	10.9	0.0	10.9	31.1	0.2	31.3	11.3	0.1	11.4	197
12. science	29.1	2.4	31.5	20.0	1.7	21.7	48.6	5.8	54.4	17.7	2.1	19.8	173
13. engineering & technology <sup>1</sup>	10.1	—	10.1	6.9	—	6.9	17.7	—	17.7	6.4	—	6.4	175
14. medicine & veterinary <sup>2</sup>	13.0	2.3	15.3	8.9	1.6	10.5	20.3	3.7	24.0	7.4	1.3	8.7	157
15. agriculture	2.7	—	2.7	1.9	—	1.9	3.7	—	3.7	1.3	—	1.3	137
16. <i>Post-graduate</i>	18.7	2.6	21.3	87.8	12.2	100.0	30.4	5.6	36.0	84.4	15.6	100.0	169
17. arts	11.0	2.1	13.1	51.7	9.8	61.5	17.3	4.2	21.5	48.0	11.7	59.7	164
18. commerce	2.0	—	2.0	9.3	—	9.3	2.7	—	2.7	7.5	—	7.5	135
19.1 law	13.2	0.3	13.5	9.1	0.2	9.3	18.9	0.4	19.3	6.9	0.1	7.0	143
19.2 law (higher)	0.2	—	0.2	0.9	—	0.9	0.4	—	0.4	1.1	—	1.1	200
20.1 education (B.T.)	2.1	1.0	3.1	1.4	0.7	2.1	7.6	3.3	10.9	2.8	1.2	4.0	352
20.2 education (higher)	0.3	0.1	0.4	1.4	0.5	1.9	0.5	0.3	0.8	1.4	0.8	2.2	200
21. science	4.3	0.4	4.7	20.3	1.9	22.2	7.3	0.9	8.2	20.2	2.5	22.7	174
22.1 technology & engineering <sup>1</sup>	0.2	—	0.2	0.9	—	0.9	0.6	—	0.6	1.7	—	1.7	300
22.2 medicine & veterinary <sup>2</sup>	0.3	—	0.3	1.4	—	1.4	1.0	0.2	1.2	2.8	0.6	3.4	400
23. agriculture	0.4	—	0.4	1.9	—	1.9	0.6	—	0.6	1.7	—	1.7	150
24. <i>Intermediate</i>												100	
24. arts, law, commerce	112.4	18.1	130.5	50.5	8.0	58.5	230.1	48.3	278.4	52.2	11.0	63.2	213
25. science & technology <sup>1</sup>	86.2	6.3	92.5	38.6	2.9	41.5	151.1	11.2	162.3	34.3	2.5	36.8	175
26. <i>Degree</i>												100	
26. arts, law, commerce	73.4	9.3	82.7	50.6	6.3	56.9	138.8	25.6	164.4	50.4	9.4	59.8	199
27. science & technology <sup>2</sup>	54.9	4.7	59.6	37.7	3.3	41.0	90.3	9.5	99.8	32.8	3.4	36.2	167
28. <i>Post-graduate</i>												100	
28. arts, law & commerce	13.2	2.1	15.3	61.9	9.8	71.7	20.4	4.2	24.6	56.6	11.7	68.3	161
29. science & technology <sup>2</sup>	5.2	0.4	5.6	24.5	1.9	26.4	9.5	1.1	10.6	26.4	3.1	29.5	181
30. <i>All levels</i>	357.2	42.3	399.5	89.4	10.6	100.0	674.4	104.2	778.6	86.6	13.4	100.0	195
31. arts, law, commerce	199.0	29.5	228.5	49.8	7.4	57.2	389.9	78.1	468.0	50.1	10.0	60.1	205
32. education	2.8	1.3	4.1	0.7	0.3	1.0	8.8	4.1	12.9	1.1	0.6	1.7	315
33. science & technology <sup>2</sup>	155.4	11.5	166.9	38.9	2.9	41.8	275.7	22.0	297.7	35.4	2.8	38.2	178

<sup>1</sup> Includes Agricultures. <sup>2</sup> Includes engineering, medicine & veterinary, and agriculture.  
Source : Perspective Planning Division, Planning Commission.



TABLE (9): OUTTURN OF QUALIFIED PERSONS IN INDIA BY LEVEL AND SUBJECT: 1950-51 AND 1955-56

examination (1)	1950-51				1955-56				index 1950-51 = 100 (10)
	number passed			percentage of girls (5)	number passed			percentage of girls (9)	
	boys (2)	girls (3)	total (4)		boys (6)	girls (7)	total (8)		
1. <i>Intermediate</i>	71,272	9,815	81,087	12.1	125,939	20,213	146,152	13.8	180
2. arts	38,748	7,913	46,661	17.0	75,764	16,482	92,246	17.9	198
3. commerce	6,393	17	6,410	0.3	11,216	104	11,320	0.9	177
4. science	25,459	1,884	27,343	6.9	37,716	3,625	41,341	8.8	151
5. agriculture	672	1	673	0.1	1,243	2	1,245	0.2	185
6. <i>Diploma</i>	8,724	5,418	14,142	38.3	10,031	2,535	12,566	20.2	89
7. .. engineering & technology	2,026	1	2,027	0.1	4,977	—	4,977	—	246
8. .. others	6,698	5,417	12,115	44.7	5,054	2,535	7,589	33.4	63
9. <i>Degree</i>	44,141	6,332	50,473	12.5	72,697	13,342	86,039	15.5	171
10.1 arts (pass)	16,586	3,738	20,324	18.4	29,117	7,899	37,016	21.3	182
10.2 .. (hons.)	1,814	450	2,264	19.9	1,865	487	2,352	20.7	104
11. commerce	5,411	22	5,433	0.4	8,203	50	8,253	0.6	152
12.1 science (pass)	9,640	767	10,407	7.4	13,370	1,577	14,947	10.6	144
12.2 .. (hons.)	713	73	786	9.3	1,077	132	1,209	10.9	154
13. engineering & technology	1,772	1	1,773	0.1	3,810	6	3,816	0.2	215
14. medicine & veterinary	1,598	325	1,923	16.9	2,583	491	3,074	16.0	160
15. agriculture	1,037	4	1,041	0.4	887	6	893	0.7	86
16. <i>Post-graduate</i>	7,423	1,100	8,523	12.9	11,742	2,344	14,086	16.6	165
17. arts	5,020	949	5,969	15.9	7,627	1,901	9,528	20.0	160
18. commerce	575	1	576	0.2	1,027	4	1,031	0.4	179
19.1 law	3,474	71	3,545	2.0	5,733	118	5,851	2.0	165
19.2 law (higher)	15	1	16	6.2	41	2	43	4.7	269
20.1 education (B.T.)	2,096	881	2,977	29.6	6,052	2,576	8,628	29.9	290
20.2 education (higher)	151	65	216	30.1	301	142	443	32.1	205
21. science	1,326	72	1,398	5.2	2,277	262	2,539	10.3	182
22.1 engineering	87	1	88	1.1	148	—	148	—	168
22.2 medicine & veterinary	106	11	117	9.4	169	33	202	16.3	173
23. agriculture	143	—	143	—	152	—	152	—	106
24. <i>Intermediate</i>									
24. arts & commerce	45,141	7,930	53,071	14.9	86,980	16,586	103,566	16.0	195
25. science, agriculture & technology	28,157	1,886	30,043	6.3	43,936	3,627	47,563	7.6	158
26. <i>Degree</i>									
26. arts, law & commerce	27,285	4,281	31,566	13.6	44,918	8,554	53,472	16.0	169
27. science & technology <sup>1</sup>	14,760	1,170	15,930	7.3	21,727	2,212	23,939	9.2	150
28. <i>Post-graduate</i>									
28. arts, Law & commerce	5,610	951	6,561	14.5	8,695	1,907	10,602	18.0	162
29. science & technology <sup>1</sup>	1,662	84	1,746	4.8	2,746	295	3,041	9.7	174
30. <i>All levels</i>	124,862	17,248	142,110	12.1	215,355	35,899	251,254	14.3	177
31. arts, law & commerce	78,036	13,162	91,198	14.4	140,593	27,047	167,640	16.1	184
32. education	2,247	946	3,193	29.6	6,353	2,718	9,071	30.0	284
33. science & technology <sup>1</sup>	44,570	3,140	47,719	6.6	68,409	6,134	74,543	8.2	156
34. doctorate	115	13	128	10.2	261	24	285	8.4	223

<sup>1</sup> Includes engineering, medicine & veterinary, and agriculture.

Source: Perspective Planning Division, Planning Commission.

TABLE (10) : NUMBER OF STUDENTS APPEARING IN AND PASSING DIFFERENT EXAMINATIONS, AND THE PERCENTAGE OF SUCCESSFUL STUDENTS

India : 1951-1952 to 1955-1956

	1951-1952	1952-1953	1953-1954	1954-1955	1955-1956
(1)	(2)	(3)	(4)	(5)	(6)
<i>Appeared</i>					
1. Intermediate Arts	109,493	139,422	169,287	189,385	207,118
2. Intermediate Science	61,891	67,155	78,973	85,042	93,405
3. Bachelor of Arts	47,841	54,710	74,824	81,421	79,920
4. Bachelor of Science	23,428	27,457	31,107	34,754	32,667
5. Master of Arts	7,780	7,808	10,281	11,729	13,215
6. Master of Science	2,144	2,114	2,667	2,946	3,142
7. Professional	36,402	41,497	48,237	53,005	48,450
8. total	288,079	340,163	415,376	458,282	477,917
<i>Passed</i>					
9. Matriculation	261,059	334,760	397,005	400,014	429,494
10. Intermediate Arts	52,373	59,703	71,640	86,741	90,182
11. Intermediate Science	25,463	29,318	33,211	39,735	41,557
12. Bachelor of Arts	24,965	27,491	35,773	40,445	37,992
13. Bachelor of Science	11,171	12,526	14,405	16,704	15,997
14. Master of Arts	6,063	6,169	7,753	8,892	9,313
15. Master of Science	1,680	1,694	2,068	2,211	2,456
16. Professional	22,684	26,269	30,162	33,181	35,772
16.1 Commerce	6,785	7,759	8,452	8,773	9,597
16.2 Law	4,538	5,562	6,802	5,996	5,628
16.3 Education & Teacher's Training <sup>1</sup>	5,251	6,215	6,749	9,492	11,106
16.4 Technology & Engineering	2,592	3,117	3,638	3,680	4,444
16.5 Medicine & Veterinary	2,324	2,512	3,541	4,089	3,888
16.6 Agriculture and Forestry	1,194	1,104	1,180	1,151	1,109
17. total	428,142	524,199	622,179	661,104	698,535
<i>Percentage passed</i>					
18. Intermediate Arts	47.8	42.8	42.3	45.8	43.5
19. Intermediate Science	41.1	43.7	42.1	46.7	44.5
20. Bachelor of Arts	52.2	50.2	47.8	49.6	47.5
21. Bachelor of Science	47.7	45.6	46.3	48.1	49.0
22. Master of Arts	77.9	79.0	75.4	75.8	70.5
23. Master of Science	78.4	80.1	77.5	75.1	78.2
24. Intermediate (I.A. & I.Sc.)	45.4	43.1	42.2	46.1	43.8
25. Degree (B.A. & B.Sc.)	50.7	48.7	47.4	49.2	48.0
26. M.A. & M.Sc.	78.0	79.2	75.8	75.7	72.0
27. Professional	62.3	63.3	62.5	62.6	73.8
28. total	50.0	48.0	46.9	49.7	48.8

<sup>1</sup> Includes "others."Source : *Education in India 1952-1953, 1954-1955 and 1955-1956.*

TABLE (11): NUMBER AND PROPORTION OF STUDENTS IN HIGHER COURSES IN RELATION TO NUMBER OF MATRICULATES IN INDIA IN 1952

courses	number on rolls			per cent			number per 10,000 matriculates		
	boys	girls	total	boys	girls	total	boys	girls	total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<i>Intermediate</i> first year intermediate courses in 1952-53									
(0.1) number of matriculates in 1952	222,371	35,767	258,138	100	100	100	10,000	10,000	10,000
1. total on rolls (1952-53)	153,941	20,330	174,271	69.2	56.8	67.5	6,920	5,680	6,750
2. arts	63,851	13,621	77,472	28.7	38.1	30.0	2,870	3,810	3,000
3. commerce	19,510	127	19,637	8.8	0.4	7.6	880	40	760
4. science	62,548	5,903	68,451	28.2	16.4	26.5	2,820	1,640	2,650
5. agriculture	1,209	—	1,209	0.5	—	0.5	50	—	50
6. diploma: technology	5,667	1	5,668	2.5	—	2.2	250	—	220
7.1. .. : education	235	201	436	0.1	0.6	0.2	10	60	20
7.2. .. : others	921	477	1,398	0.4	1.3	0.5	40	130	50
<i>Degree</i> first year degree courses in 1954-55									
(0.2) number passed intermediate in 1954	98,011	15,612	113,623	100	100	100	4,408	4,365	4,402
8. total on rolls (1954-55)	74,947	10,727	85,674	76.5	68.7	75.4	3,370	2,999	3,319
9. arts (pass & hon.)	33,262	7,654	40,916	33.9	49.1	36.0	1,496	2,140	1,585
10. commerce	12,515	77	12,592	12.8	0.5	11.1	563	22	488
11. science	19,567	2,146	21,713	20.0	13.7	19.4	880	600	841
12. technology & engineering	4,000	1	4,001	4.1	—	3.5	180	—	155
13. medicine & veterinary	3,056	733	3,789	3.1	4.7	3.3	137	205	147
14. agriculture	1,221	5	1,226	1.2	—	1.8	55	1	47
15. diploma (others)	1,326	111	1,437	1.4	0.7	1.3	59	31	56
<i>Post-graduate</i> first year post-graduate courses in 1956-57									
(0.3) numbers awarded degrees in 1956	51,698	9,332	61,030	100	100	100	2,325	2,609	2,364
16. total on rolls (1956-57)	33,988	6,084	40,072	65.7	65.2	65.7	1,528	1,701	1,552
17. arts	9,015	2,023	11,038	17.4	21.7	18.1	405	566	428
18. commerce	1,422	11	1,433	2.8	0.1	2.3	64	3	55
19. law	11,698	220	11,918	22.6	2.4	19.5	526	61	462
20. education	7,349	3,295	10,644	14.2	35.3	17.5	330	921	412
21. science	3,375	382	3,757	6.5	4.1	6.2	152	107	146
22. agriculture	264	3	267	0.5	—	0.4	12	1	10
23. diploma (others)	865	150	1,015	1.7	1.6	1.7	39	42	39
.....									
<i>Science &amp; technology</i> first year science & technology (total)									
24. intermediate (1952-53)	69,424	5,904	75,328	31.2	2.5	16.4	3,120	1,640	2,920
25. degree (1954-55)	27,844	2,885	30,729	12.5	1.2	6.7	1,252	806	1,190
26. post-graduate (1956-57)	10,988	3,680	14,668	4.9	1.6	3.2	494	1,029	568

Source : Perspective Planning Division, Planning Commission.

Note : Percentage figures given in cols. (5), (6) and (7) are on the basis of the number of candidates who passed the appropriate previous examination as given in lines (0.1), (0.2) and (0.3).

TABLE (12): TOTAL CONSUMER EXPENDITURE PER PERSON PER 30 DAYS AND CUMULATIVE PERCENTAGES OF POPULATION AND CONSUMER EXPENDITURE BY SUB-SAMPLES

National Sample Survey: 9th Round: May—November 1955; All India (Rural)<sup>1</sup>

per- cent- tile	number of sample households			total consumer expenditure in Rs. per person per 30 days						cumulative percentage of					
				limiting values			average expenditure			total population			total consumer expendi- ture		
	s.s.1	s.s.2	comb.	s.s.1	s.s.2	comb.	s.s.1	s.s.2	comb.	s.s.1	s.s.2	comb.	s.s.1	s.s.2	comb.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
5	39	39	78	4.91	4.79	4.90	4.01	3.82	3.90	6.32	5.58	5.83	1.69	1.39	1.50
10	38	35	71	5.99	5.85	5.92	5.43	5.39	5.39	12.39	10.86	11.56	3.88	3.26	3.54
15	35	37	73	6.74	6.88	6.80	6.39	6.38	6.38	17.17	15.94	16.50	5.91	5.37	5.62
20	36	43	78	7.54	7.90	7.76	7.25	7.35	7.28	22.16	21.47	21.72	8.32	8.03	8.13
25	37	37	76	8.52	8.59	8.56	8.05	8.31	8.20	26.82	27.05	26.98	10.81	11.06	10.97
30	33	42	75	9.36	9.57	9.53	8.96	9.19	9.06	32.78	32.49	32.61	14.36	14.33	14.34
35	38	41	79	10.17	10.39	10.31	9.80	9.95	9.89	37.43	38.06	37.78	17.39	17.95	17.71
40	38	34	72	11.03	11.09	11.07	10.66	10.74	10.69	42.93	43.75	43.13	21.29	21.95	21.48
45	34	36	73	11.80	12.06	11.92	11.42	11.68	11.49	47.56	48.50	47.74	24.80	25.58	24.97
50	41	43	80	12.83	13.02	12.88	12.35	12.59	12.43	53.11	53.41	53.12	29.36	29.62	29.38
55	40	38	78	14.14	14.05	14.14	13.46	13.45	13.44	58.19	58.65	58.37	33.90	34.23	34.03
60	37	43	80	15.13	15.55	15.24	14.57	14.73	14.64	63.77	63.75	63.83	39.30	39.14	39.30
65	42	34	77	16.61	16.97	16.77	15.81	16.12	16.00	68.51	67.87	68.32	44.29	43.48	44.04
70	44	38	82	18.49	18.59	18.56	17.61	17.88	17.78	74.26	72.37	73.38	51.02	48.75	49.97
75	40	39	78	19.85	20.08	20.02	19.14	19.37	19.26	78.60	77.55	77.94	56.55	55.30	55.76
80	37	40	76	22.59	22.01	22.11	21.22	21.27	21.19	82.95	82.65	82.73	62.69	62.40	62.45
85	39	31	72	24.95	23.60	24.35	23.77	22.97	23.36	87.83	86.19	87.07	70.40	67.71	69.12
90	40	40	79	29.57	27.53	28.59	27.40	25.42	26.23	92.60	91.08	91.47	79.09	75.85	76.74
95	40	40	81	38.05	38.38	38.13	32.85	32.06	32.17	96.92	96.07	96.46	88.54	86.29	87.31
100	40	38	78	194.41	128.86	194.41	55.96	53.30	54.31	100	100	100	100	100	100
all	768	768	1536				15.03	15.24	15.15						

Number of sample villages including 4 uninhabited villages in each sub-sample: 772 (s.s.1), 772 (s.s.2), 1544 (combined).

Number of sample households: 768 (s.s.1), 768 (s.s.2), 1536 (combined).

<sup>1</sup> Excludes Jammu & Kashmir.

TABLE (13) : EXPENDITURE IN RUPEES PER PERSON PER 30 DAYS BY ITEMS OF CONSUMPTION AND BY SUB-SAMPLES

National Sample Survey : 9th Round : May—November 1955 ; All India (Rural)<sup>1</sup>

per- cen- tile	popu- lation <sup>2</sup> in lakh (10 <sup>3</sup> )	expenditure in rupees per person per 30 days																				
		food grains			food total			sugar			clothing			education			medicine			medical services		
		s.s.1	s.s.2	comb.	s.s.1	s.s.2	comb.	s.s.1	s.s.2	comb.	s.s.1	s.s.2	comb.	s.s.1	s.s.2	comb.	s.s.1	s.s.2	comb.	s.s.1	s.s.2	comb.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)
5	197	2.34	2.49	2.39	3.12	3.18	3.12	0.04	0.04	0.04	0.10	0.05	0.08	0.00	0.02	0.01	0.01	0.00	0.01	0.00	-	0.00
10	194	3.01	3.14	3.09	4.41	4.22	4.32	0.06	0.06	0.06	0.09	0.23	0.16	-	0.01	0.01	0.06	0.04	0.05	-	-	-
15	167	3.43	3.54	3.48	5.05	4.94	5.02	0.10	0.11	0.11	0.09	0.42	0.22	0.02	0.01	0.02	0.03	0.04	0.04	0.02	0.02	0.02
20	177	3.42	3.88	3.60	5.15	5.63	5.32	0.13	0.11	0.12	0.33	0.59	0.52	0.00	0.01	0.00	0.07	0.01	0.04	0.05	-	0.02
25	178	4.46	4.37	4.50	6.43	6.48	6.47	0.09	0.21	0.14	0.32	0.34	0.31	0.00	0.05	0.03	0.03	0.01	0.02	-	-	-
30	191	4.28	4.50	4.39	6.73	6.86	6.83	0.25	0.16	0.23	0.27	0.61	0.44	0.02	0.01	0.02	0.08	0.03	0.06	0.01	0.06	0.04
35	175	5.11	5.06	5.05	7.43	7.81	7.56	0.28	0.26	0.24	0.72	0.72	0.74	0.03	0.00	0.01	0.03	0.02	0.02	0.04	-	0.02
40	181	5.44	5.43	5.34	8.16	8.11	8.11	0.26	0.25	0.28	0.61	0.66	0.67	0.08	0.02	0.05	0.05	0.01	0.04	-	0.01	-
45	156	5.18	6.02	5.61	8.59	9.00	8.79	0.35	0.28	0.30	0.66	0.63	0.62	0.04	0.02	0.04	0.15	0.23	0.15	0.02	-	0.02
50	182	6.25	5.70	6.00	9.40	9.65	9.52	0.16	0.34	0.28	0.69	0.57	0.62	0.08	0.04	0.06	0.11	0.08	0.12	-	-	0.01
55	177	5.45	6.09	5.80	9.38	9.97	9.70	0.38	0.35	0.34	1.24	0.79	0.99	0.22	0.14	0.17	0.11	0.09	0.10	0.04	0.02	0.03
60	185	7.05	5.99	6.56	11.13	10.22	10.88	0.33	0.44	0.43	1.00	0.97	1.02	0.05	0.21	0.11	0.15	0.33	0.17	0.08	0.00	0.04
65	152	6.29	6.09	6.30	11.01	11.28	11.12	0.64	0.66	0.60	1.85	1.38	1.62	0.04	0.01	0.05	0.21	0.18	0.23	0.08	0.16	0.08
70	171	5.68	7.03	6.18	12.07	12.22	11.98	0.51	0.60	0.53	1.74	1.67	1.69	0.13	0.15	0.13	0.18	0.19	0.24	0.02	0.02	0.06
75	154	7.15	7.23	7.19	13.32	13.44	13.36	0.49	0.66	0.58	2.19	1.88	2.04	0.12	0.07	0.11	0.18	0.32	0.24	0.02	0.05	0.04
80	162	7.41	7.61	7.50	14.22	14.40	14.30	0.87	0.49	0.69	2.12	2.50	2.27	0.21	0.09	0.14	0.18	0.52	0.39	0.08	0.07	0.07
85	147	7.82	8.49	8.05	15.44	16.70	16.25	0.73	0.71	0.76	2.11	0.92	1.50	0.23	0.20	0.22	0.81	0.46	0.49	0.26	0.18	0.14
90	149	8.36	8.09	8.21	16.28	16.52	16.37	0.68	0.98	0.85	3.43	2.53	2.89	0.15	0.29	0.30	0.82	0.44	0.82	0.19	0.19	0.29
95	169	9.66	7.21	8.50	20.13	17.80	18.30	1.14	1.27	1.08	3.86	4.27	4.24	0.71	0.51	0.46	0.43	1.32	0.84	-	0.39	0.21
100	120	10.51	8.97	9.50	22.88	22.65	23.02	0.98	1.24	1.19	5.87	4.90	5.28	0.58	0.29	0.48	8.37	1.12	4.21	3.43	0.42	1.69
all	3384	5.70	5.71	5.70	9.99	10.16	10.08	0.39	0.44	0.41	1.31	1.27	1.29	0.12	0.10	0.11	0.44	0.25	0.34	0.15	0.07	0.11

Number of sample villages including 4 uninhabited villages in each sub-sample : 772 (s.s.1), 772 (s.s.2), 1544 (combined).

Number of sample households : 768 (s.s.1), 768 (s.s.2), 1536 (combined).

<sup>1</sup> Excludes Jammu & Kashmir.

<sup>2</sup> Population estimates used elsewhere are based on projection.

TABLE (14) : CUMULATIVE PERCENTAGES OF EXPENDITURE PER 30 DAYS BY ITEMS OF CONSUMPTION AND BY SUB-SAMPLES

National Sample Survey : 9th Round : May—November 1955; All India (Rural)\*

per- cen- tile	cumulative percentage of expenditure on																				
	food grains			food total			sugar			clothing			education			medicine			medical services		
	s.s.1	s.s.2	comb.	s.s.1	s.s.2	comb.	s.s.1	s.s.2	comb.	s.s.1	s.s.2	comb.	s.s.1	s.s.2	comb.	s.s.1	s.s.2	comb.	s.s.1	s.s.2	comb.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
5	2.59	2.43	2.44	1.98	1.75	1.80	0.61	0.51	0.52	0.48	0.20	0.34	0.20	0.90	0.52	0.15	0.06	0.12	0.07	—	0.05
10	5.80	5.33	5.54	4.65	3.94	4.26	1.56	1.25	1.34	0.88	1.16	1.04	0.20	1.48	0.79	0.99	0.84	0.94	0.07	—	0.05
15	8.68	8.48	8.55	7.07	6.41	6.72	2.76	2.51	2.62	1.22	2.83	1.88	0.98	1.99	1.45	1.35	1.60	1.45	0.66	1.45	0.92
20	11.87	12.24	11.85	9.64	9.47	9.48	4.39	3.86	4.10	2.47	5.42	4.01	1.14	2.25	1.54	2.12	1.76	2.01	2.38	1.45	2.08
25	15.31	16.51	16.00	12.64	13.03	12.85	5.42	6.57	5.90	3.63	6.93	5.27	1.17	4.87	2.88	2.45	1.91	2.26	2.38	1.45	2.08
30	19.79	20.80	20.34	16.65	16.70	16.67	9.19	8.53	9.06	4.88	9.56	7.18	2.41	5.15	3.78	3.54	2.63	3.22	2.74	6.42	3.94
35	23.96	25.73	24.92	20.12	20.98	20.55	12.46	11.91	12.10	7.43	12.73	10.16	3.47	5.21	4.28	3.83	3.04	3.55	3.91	6.42	4.73
40	29.22	31.15	29.92	24.60	25.52	24.85	16.14	15.22	15.66	9.98	15.71	12.94	7.14	6.21	6.71	4.46	3.26	4.09	3.91	6.78	4.74
45	33.42	36.16	34.45	28.58	29.74	28.87	20.25	18.28	19.00	12.31	18.07	15.15	8.87	7.18	8.24	6.05	7.60	6.15	4.65	6.78	5.35
50	39.51	41.07	40.12	33.80	34.39	33.96	22.58	22.15	22.60	15.24	20.28	17.75	12.33	9.29	11.12	7.39	9.12	8.04	4.65	6.78	5.64
55	44.36	46.66	45.45	38.57	39.54	39.01	27.51	26.34	26.86	20.04	23.55	21.79	21.76	16.60	19.39	8.70	10.99	9.57	6.09	8.43	6.86
60	51.26	52.01	51.73	44.78	44.66	44.91	32.24	31.52	32.58	24.29	27.48	26.12	23.96	27.43	24.70	10.62	17.66	12.33	8.89	8.60	8.81
65	56.50	56.40	56.69	50.02	49.24	49.86	39.98	37.80	39.13	31.02	31.97	31.79	25.57	27.71	26.60	13.35	20.65	15.35	11.44	18.13	11.87
70	62.22	61.96	62.17	56.95	54.66	55.88	47.42	44.03	45.59	38.66	37.92	38.44	31.93	34.37	32.49	15.66	24.14	18.94	12.03	19.51	14.48
75	67.67	68.51	67.92	62.75	61.51	61.92	52.81	51.87	51.96	45.93	45.58	45.65	36.46	37.94	37.12	17.49	30.63	22.07	12.63	23.10	16.05
80	73.32	75.32	74.22	68.93	68.73	68.73	62.44	57.59	59.95	52.99	55.67	54.10	44.18	42.45	43.21	19.30	41.28	27.50	14.98	27.90	19.19
85	80.01	80.58	80.33	76.47	74.55	75.71	71.51	63.33	67.86	60.87	58.25	59.15	53.56	49.65	51.72	28.26	47.83	33.70	23.55	36.93	24.71
90	87.00	87.52	86.66	84.24	82.50	82.86	79.77	74.33	76.85	73.39	68.02	69.03	59.38	63.59	63.90	37.17	56.32	44.24	29.72	49.81	36.23
95	94.32	93.82	94.09	92.95	91.23	91.91	92.32	88.84	89.81	86.15	84.79	85.45	85.04	88.75	84.73	41.38	82.47	56.49	29.72	76.93	45.66
100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Number of sample villages including 4 uninhabited villages in each sub-sample : 772 (s.s.1), 772 (s.s.2), 1544 (combined).

Number of sample households : 768 (s.s.1), 768 (s.s.2), 1536 (combined).

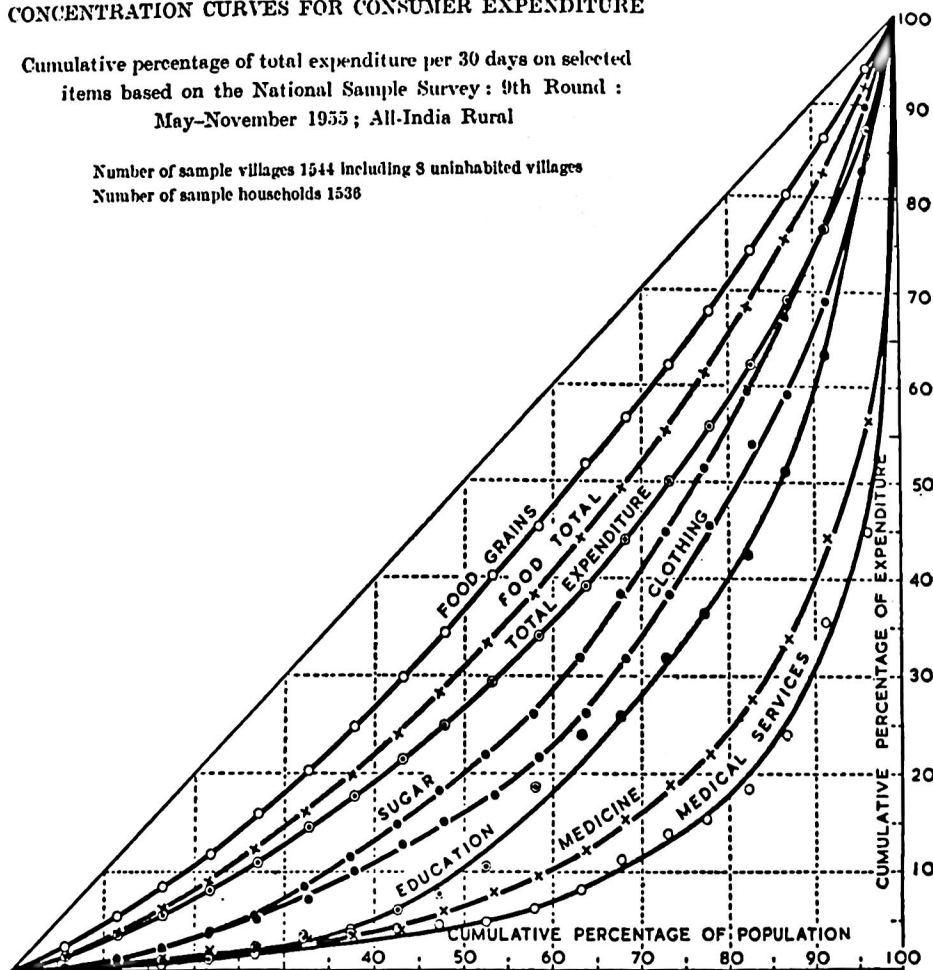
\* Excludes Jammu & Kashmir.

- Excludes Jammu & Kashmir.

# CONCENTRATION CURVES FOR CONSUMER EXPENDITURE

Cumulative percentage of total expenditure per 30 days on selected items based on the National Sample Survey: 9th Round: May–November 1955; All-India Rural

Number of sample villages 1544 including 8 uninhabited villages  
Number of sample households 1538



limit of per capita expenditure per 30 days	percentage of household	food grains	food total	total expenditure	sugar	clothing	education	medicine	medical services
(0.1)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
share in percentage of total expenditure									
Rs. 6	bottom 10 p.c.	5.5	4.3	3.5	1.3	1.0	0.8	0.9	0.05
Rs. 13	lower 50 p.c.	40.1	34.0	29.4	22.6	17.8	11.1	8.0	5.6
(Rs. 194)	top 10 p.c.	13.3	17.1	23.2	23.2	31.0	36.1	55.8	63.8