

# SOME STATISTICAL PROBLEMS RELATING TO THE AGRICULTURAL SECTOR\*

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I am grateful to the Council of the Indian Society of Agricultural Statistics for kindly inviting me to deliver the Technical Address at this Twenty-first Annual Conference. I must, however, confess to a feeling of diffidence, especially as I was working as a general purpose statistician abroad on U.N. Assignment during the last eight years, and had no opportunity to give sustained and deeper thought to the current problems of agricultural statistics in India.

2. Considerable progress has been made in India since 1943, in regard to the development of agricultural statistics particularly the coverage of the areas for which land use was reported, the improvement through rationalised supervision of reporting work and the objective measurement of crop yields through properly designed crop cutting experiments on a sampling basis.<sup>1</sup> As a result, I understand about 90% of the land area is covered by reporting and objective estimates of crop production are made for most of the food crops. During my U.N. Assignment in Asia and Africa, I found that these methods were being increasingly promoted and adopted in many other developing countries of these regions, of course, with suitable adaptations to their own conditions.

3. Even so, it is clear from the various discussions and seminars conducted by the Society from time to time, and from the Technical Addresses in recent years that there are still gaps, insufficient coverage, deficiency due to non-comparability over space and time, and much still remains to be done<sup>2,3,4</sup>. I do not propose to review the position regarding the different aspects—area, production, marketable

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† The available reference facilities for preparation at my station were poor. I shall be grateful for corrections regarding mistakes or obsolescence regarding the facts or situations presented in this address.

surplus ; production costs, farm management, employment prices etc., but confine myself to certain general and specific issues arising out of such a review, which pose as it were challenges to the statisticians in discharging their own share of responsibility in the stupendous task facing the country in the field of agriculture, at this critical stage.

4. With each successive National Plan, the processes of planning become more and more intensive and detailed and the economy gets more and more complex. Consequently the formulation of the Plan, its implementation and the evaluation of the progress in implementation, require more comprehensive and detailed data and further techniques of study.

5. As observed recently by Prof. D.R. Gadgil<sup>5</sup> : "While the initial stages of planned development, uniform large efforts all over the country was alone possible and proved useful. As development proceeds it becomes more and more necessary to plan in detail and to give attention to local needs and circumstances. We have in future to look to an era of much greater importance attached in planned development to efforts at the State and district level."

6. We have reached a stage when statistics should help not only in assessment of the overall position and problems, but also in formulating and implementing detailed policy measures towards the solution of such problems. This to my mind requires reliable estimates not only of the overall averages but even more so, their distribution at different levels and their changes over time if measures are to be taken to improve particularly the unsatisfactory levels, and the results thereof to be evaluated.

7. Thus taking the statistics of yields of crops it is not enough to know just the average yield rates. When it comes to implementation of measures for raising the yields, one needs to distribution according to yield rates, the areas or types of farming with higher yield rates together with reasons for the same and similarly for low yield rate areas, so that steps could be taken to raise the low yields.

8. Again, it will be seen from the Technical Address of Dr. S.R. Sen<sup>6</sup> (1967) on "Growth and instability in Indian Agriculture" it is essential to evolve measures not only to achieve the requisite rate of growth of food production but also reduce the increasing instability that often accompanies such growth. For

this purpose he has brought a new dimension by classifying the area in each State into :

- A. Areas where there is an assured water supply both in volume and spread, either from assured rainfall or from sources of irrigation.
- B. Areas where supply of water either from rainfall or sources of irrigation is largely dependent on the monsoon.
- C. Areas where there is no dependable irrigation and where rainfall is scanty and precarious.

Dr. Sen's study has revealed that it is the 'B' areas where production and instability are high, which is the main culprit and needs more attention. Thus even within a State, statistics of area and yield are necessary separately for such areas.

9. Taking agricultural holdings, what is important is not only the average size of the holdings but their distribution according to size, for formulating any measures for improvement of agriculture. When we take the problem of the marketable surplus, for purposes of action, it is necessary to estimate not only the overall surpluses, but the contributions from farms of different sizes and types, from the different regions. The classification of data on holdings by size of holding is basic in the F.A.O. Agricultural Census Programmes. Incidentally, when I analysed the data of the Rural Economic Survey of Ajmer and Merwara<sup>8</sup> in 1941, I found that for determining the sizes of the holdings it is not very meaningful to add up numerically the sizes of the land of the different types—the well irrigated (chahi), the tank irrigated (Talabi) and unirrigated (barani) land. Many cultivators had more than one type of land. One has to ascertain after investigation their equivalents in terms of 'chahi' land before further analysis. Otherwise, it could be even misleading.

10. The need for such detailed distribution data arises in diverse fields besides agriculture. When the problem is to fix wage, for agricultural and other workers, especially the minimum wage, the average wage levels in a State or region are not enough. One needs even more the distribution of the workers according to wage levels. The main interest is really in the lower wage levels for which reliable and detailed data are required so that the reasons for low wages investigated and remedial measures formulated to raise them. This was what I felt when I was associated with the First All-India Agricultural Labour Enquiry during the 1950s.

11. Another important field is the size distribution of personal income, in the context of the demand for ensuring its equitable distribution amongst the different social classes, which is one of the important objectives of the National Planning. The national income of the country and the per capita national average are no doubt useful but not adequate. The Committee on Distribution of Income and Levels of Living<sup>9</sup> (1964) after detailed examination of the available data have observed. "The most important conclusion which emerges from this study is that we do not have the required data for drawing valid conclusions concerning the change in income distribution, which might have taken place over the two plan periods".

12. Similar examples pointing out the need for distribution data by size can be cited from the fields of industry, employment unemployment and under-employment, etc.

13. India is one of the leading countries in regard to theoretical work on sampling and practical experience in large-scale field sample surveys. The advantages of well-organised sample surveys, from the point of view of costs, better quality data, and speed, and their suitability under the conditions prevailing in developing countries like India, are well recognised. Sampling has been successfully employed in a variety of fields, agriculture, industry, demography, labour force, level of living, etc. There is no need to dilate further in specific terms.

14. But as explained above, the expanding needs for more detailed data showing the distribution according to different levels and cross sections and their changes over time will no doubt require the development of intricate sample designs and the statistician will have to apply his mind further how best this could be done.

15. Incidentally, permit me to refer to another important problem from the point of view of the practical aspects of conducting sample surveys. It is well-known that even with the best of intentions and resources it is not always possible to strictly adhere to the sampling design in any large-scale field sample survey and there are invariably some imperfections due to practical reasons beyond the control of the field agency, in spite of best efforts. In such cases, it is not fair for the mathematical statistician in his ivory tower to complain that the sampling design has not been strictly adhered to and therefore the data could not be analysed and is of

no use. What best should be done in such cases in this imperfect world is really a task for the statistician. It is known that every differential equation is not solvable in terms of known mathematical functions; but when the design of a bridge involves a differential equation, which could not be solved in terms of mathematical functions, it will not be enough for the mathematician to say that the equation could not be solved and therefore the bridge could not be designed. The mathematician has developed the method of approximate solution and when it comes to the construction of bridge what is really needed is the approximate solution and not the mathematical one. This analogy, it seems to me, is relevant to the problem stated above. I think it is for the statistician to study these practical problems which arise, renounce his perfectionist attitude, and find solution approximate though, and not throw back his own helplessness on the users of statistics.

16. The immense scope for sampling methods and sample surveys for collection of data through trained investigators, with the resulting advantages, especially under the conditions of developing countries, has been well realised and utilised. But sampling even with the enlargement in size required and ingenuity in design cannot be an answer to all the needs in a fast developing economy, especially those for local data down to the smallest administrative area, like a block or a village there in, consisting of a very small number of the units of study.

17. This is particularly so in the field of agriculture<sup>10</sup>. The planning of the agricultural sector in the successive plans continued to be made from the national level downwards. It is being increasingly realised that while the national targets are formulated more in accordance with national aspirations and limitations, from the point of view formulating economically sound and technically feasible measures for realising them, it is also necessary to draw up simultaneously the programmes from below, say for each Community Project Block, which is recognised as the centre for co-ordinated activities at the local level. This in turn will have to be built from that for each village, or farm unit in the village. The Planning Commission has repeatedly emphasised the need for detailed planning at block or village level.

18. Obviously, such data at local level could not be provided by a nation-wide sample survey. It could only be done through an agricultural Census on a complete enumeration basis which would

facilitate aggregation at any desired level. But considering the circumstances of developing countries, with a large illiterate population and limited resources, and the gigantic nature of the Census operation in a vast country like India, it has to be content with a minimum basic list of information of a stable nature, which it would be feasible to collect in a Census using the available agencies. No doubt the census is a stupendous job but a stage has been reached when it should be considered.

19. However, it is well known even here, sampling has an important role to play in controlling and improving field work through rationalised supervision of the work of the primary agencies.

20. The agricultural census data, like the population census village directory, will provide only the basic minimum data, at a local level which can be collected in a census type of operation. At the same time there can be no denying the increasing demands of the development agencies at the lower levels—District, Block, Village for more detailed data regarding their areas for purposes of their own micro level planning and implementation. The local agencies should be encouraged to become statistics-minded and to collect the additional data they may need for their purposes but not with a view to their aggregation at the higher state or national levels. Such data collection will in the nature of things be cruder still, although much could be done by proper standardisation of village records, developing appropriate manuals, giving training to the extent feasible and exercising proper supervision.

21. Thus we have reached a stage when we need the decennial Censuses on a complete enumeration basis confined to the minimum stable information, periodic sample surveys during the inter-censal period providing estimates of more detailed data, at the national, and lower levels, and also local data which could be culled from village records or collected by village or development agencies for their own needs.

22. On the other hand, there is also the need for intensive and highly specialised diagnostic studies to be undertaken by specialists. As examples might be cited the farm management surveys by specialists and the food consumption surveys by nutrition experts. Such surveys have also become quite important in the context of planned development, for collection of data of a finer type than those provided through surveys conducted by general purpose investigators.

23. Taking farm management studies, they require intensive day-to-day observations by trained investigators stationed in the areas under study, during the entire agricultural cycle. Obviously such studies can only be undertaken in a limited number of geographical locations rather than on a scale needed for a sample survey for purposes of estimation for a state or the country as a whole. Therefore, they are better done in areas purposively selected. Thus in the farm management surveys<sup>11</sup> organised by the Planning Commission in co-operation with the Ministry of Food and Agriculture the first programme covered one typical region purposively chosen in each of the five states. With the experience thus gained it was extended to typical regions of three more states and subsequently to four more. They are all intensive surveys continued over period of 2 to 3 years. This is all that is possible. The question arises how best to utilise these limited studies for typical regions in the States, for policy measures for the states or the country as a whole.

24. Similarly, any survey of food consumption in a large-scale sample survey is bound to be crude as compared to the meticulous once conducted by nutritional experts from day-to-day observations of purchases, actuals used for food, wastages to be allowed for, before working out the calorific and nutritional content. Such intensive studies by highly specialised staff can only be carried out in a limited number of areas, and not on a scale needed for a sample survey covering a State or a Region and intended to provide estimates for the State, or the Region. According to the FAO Survey (1958)<sup>12</sup> of the 57 food consumption surveys, reported from all over the world, only 17 provided any information on the quantities of food consumed and only 8 were nation-wide surveys based on interviews. Of these four were based on too small a sample to permit any valid estimates of the consumption levels applicable to the country as a whole.

25. Such intensive diagnostic studies can only be conducted in a very limited number of areas in the country as a whole, or in a State, which may not be adequate from the point of view of the sample size required for estimation. Then what should be done? Should we restrict the areas of study in the region for which the sample should be adequate and use the data only for that region, or should we conduct them in a few typical areas, based on apriori-knowledge and judgment, spread over the state or the country as a whole? The latter seems to be the practice generally followed;

what should be done in that case to draw valid conclusion for the state or country as a whole ?

26. In this connection I would like to suggest in these typical areas where intensive surveys are conducted by nutritional specialists, simultaneous investigations following the general purpose sample survey procedures might be undertaken and the results of the two compared and studied and then the sample survey results suitably calibrated. I have been planning such simultaneous surveys by the Rural Economic Survey Organisation and the Nutrition Organisation in Nigeria towards the end of my UN assignment as Chief Statistician of the country.

27. In any case there is urgent need for such data and such studies should also be encouraged, even though they could be conducted only in a limited scale and hence on a purposive basis. It is only such studies which can throw light on how best policy measures should be evolved to solve the problems concerned, as distinguished from spotting out the problems.

28. Thus we need data collected by different types, through censuses, sample surveys, which will no doubt play a dominant role under the circumstances of developing countries, intensive and diagnostic type studies and as by-products of administration and it seems to me that they should all be encouraged and assisted, in proper planning and implementation, and should be judiciously utilised.

## Section II

29. I shall now review the specific problems of measurement of employment, unemployment and under-employment, in the rural and in particular the agricultural sector. In this field, under the special circumstances of development, unemployment and under-employment developed in the context of the advanced economies have been found to be inadequate and to some extent unsuitable. The situation has called for a wider complex of concepts and methods of measurement. It will also serve to illustrate the need for properly coordinated data to be collected through different types of data collection such as, censuses, sample surveys, farm management studies etc.

30. The various problems relating to the concepts and method of measurement have been the subject of considerable investigation

and discussion in India *vis-a-vis* the international recommendations by the I.L.O. These were considered in planning and conducting the population census, to some extent. The National Sample Survey has been experimenting on several alternative concepts and methods of measurement during its various rounds. Based on the NSS and other similar experience the Central Statistical Organisation has brought out a Manual<sup>13</sup> on 'Standards for Surveys on Labour Force, Employment and Unemployment' in 1961. The concepts followed in the First and Second Agricultural Labour Enquiries were the subject of detailed discussion at a seminar held at the Institute of Economic Growth, Delhi, in March, 1961. Again this subject formed a topic of considerable discussion at the All-India seminar on Agricultural Labour<sup>14</sup> organised by the Ministry of Labour and Employment, in August, 1965. This problem formed the subject of a number of interesting papers by M.V.S. Rao<sup>15</sup>, B.N. Datar<sup>16</sup>, V.M. Dandekar<sup>17</sup>, T. Chellaswami<sup>18</sup> and others. At the same time eminent economists abroad and in India have also been discussing the conceptual and measurement aspects of under-employment, and special attention is drawn to the clarification of the concepts of disguised under-employment by P.M. Resentein<sup>19</sup>-Redan. Following this clarification, J.P. Bhattacharjee<sup>20</sup> carried the analysis further by separating the total disguised under-employment into two components *viz.*, (i) disguised removable under-employment and (ii) disguised fractional under-employment. More recently Gunar Myrdal<sup>21</sup> has severely criticised the development of the concept of under-employment and evolving measures thereto, using various outside norms, and rushing to estimation of labour surplus under assumption of a static situation of unchanged conditions. I have fully drawn on all these contributions and given references to them at appropriate places. It seems to me that there is great need to pursue the studies in a more coordinated manner in order to provide the much needed empirical data for development of the appropriate theory and formation of suitable employment policy measures in the context of National Planning.

31. In the developed countries, and to some extent in the organised sectors in the Developing countries, employment and unemployment are sharply defined concepts. Most of those in the labour force have well-defined paid jobs, of a more or less regular nature. Those without jobs invariably seek for work if they are available for work and can be strictly defined as unemployed. If there is an increase in the aggregate demand for goods and services and therefore

for labour, it will reflect itself in employment opportunities. The concepts of underemployment is a marginal one. It arises in situations where dismissed workers find an occupation inferior to their skill. They are of exceptional and temporary nature.

32. On the other hand, situation in regard to the employment pattern in the rural and in particular by the agricultural sector in the developing countries is entirely different and is quite a complex one. An idea of the vastness and complexity of this sector in India can be had from the fact that about 80% of the population live in villages and 85% of the working population therein are engaged in agricultural and allied activities. About 40% of the workers are self employed workers, another 30% unpaid family workers and only the remaining 30% wage-paid employees.

33. From the point of view of the rural employment pattern and utilisation of man-power, four distinct classes of agricultural workers may be distinguished. First the minority of cultivators with large holdings, which keep them busy, in fact over-busy during the peak season, who, even during the slack season have some work by way of preparation for the next year. Next come the cultivators with holdings not so large but adequate who are quite busy during the agricultural season but sometimes either under-employed or unemployed during the slack season or even prefer not to work considering such idle time available as well earned respite. Then there is the large number of cultivators with small uneconomic holdings, who except perhaps for the peak season do not find enough work on their land during the remaining agricultural season and seek wage-paid employment in agricultural or other activities, and of course more so during the slack seasons. Even they do not remain continuously unemployed say, for over a week or so, as there is always some miscellaneous work to do in their own fields. Lastly, landless agricultural labourers, most of them casual without continuous employment excepting for the peak season, working irregularly and intermittently even during the agricultural seasons. During the slack seasons they scramble for whatever limited non-agricultural employment may be available, and take least remunerative jobs like driving bullock carts, grazing of cattle, collection of fuel and grass, splitting of firewood, vegetable selling, construction of mud walls for rural housing, domestic services, etc. and remain without work for the remaining time. But as in the developed countries, they may not be actively seeking work, but still available for work if offered. At certain times

they may not be available for work due to illness, social engagements etc.

34. Even the labour force comprising those working and available for work is not a steady one and varies over the year, especially when family members including women and children are drafted to agricultural work, as and when exigencies demand.

35. Thus the strength of labour force including the employed and the unemployed (following the extended definitions of availability for work instead of seeking work) varies, the employment is irregular and intermittent, the occupations vary from self-employment to wage-employment in agricultural and other miscellaneous non-agricultural occupations, the periods of 'not working' but 'available work' vary. Even while working, the intensity varies from season to season, week to week and day to day.

36. The nature of under-employment which is marginal, and of a temporary nature in the developed countries, refers in the developing countries to the vast and long-term under-utilisation of human resources in which permanently and structurally more labourers are tied up in various lines of production than is necessary, with inadequate employment opportunities, in terms both of quantity and quality, reflecting as it were, the stage of under-development.

37. When this is the situation there is not much point in trying to force in, and be content with, sharply defined concepts of the 'number' employed, 'number' unemployed and 'number' under-employed etc. and measurement at a single or few points of time. The employment pattern is a complex one calling for a wider complex of concepts. The emphasis should shift from the analysis of the 'number' to that of the 'labour-time disposition' and the intensity of work. The ideal way to build up the pattern of employment is to ascertain from every one in the labour force, his labour-time disposition each day, for one full agricultural year, in view of the wide variations during the annual cycle. We have to deal with the entire continuum of labour-time disposition ranging from that of the fully employed to the completely unemployed and consider further the intensity of the work done. There has been considerable discussion of late as to what has been and should be done consistent with the needs and conditions.

#### **Employment Data-Population Census**

38. A logical and historical start is a broad-based and crude measure of the economically active population provided by the

Decennial Population Census following the 'gainful worker' approach with the year as the reference period and *on a complete enumeration basis*, so that aggregation could be made at any desired local level.

39. Even the data provided by the Censuses in the different decades in India are not comparable amongst themselves due to the changing definitions of the 'gainful worker', from Census to Census. \*According to the 1961 census a person is reported as a 'worker' in the case of seasonal work like cultivation, livestock, household industry, etc., *if he had done regular work for more than one hour a day throughout the greater part of the working season* and in the case of regular employment in any trade, profession, etc., if he was employed during any one of the fifteen days preceding the day on which he was enumerated. Thus the workers in the agricultural sector include those who work from a minimum of one hour each day during the major part of the season to those working almost full time throughout the season and thus there can be wide variations in the labour-time utilised in agriculture. But the census by its very nature cannot go further and hence the need for supplementary surveys.

#### Employment Data—Agricultural Census

40. Let us now take up the measurement of employment in agriculture in the Agricultural Census Programme as prepared by the F.A.O. in their 1970 World Programme. The main interest in the agricultural census is in the holding as the active force of agriculture and therefore in the knowledge of its various structural aspects. Employment is looked at more from the point of view of labour input in agriculture than from that of the worker. The cultivated holdings above a minimum size to be determined by the country form the units of study and will cover all those members of the cultivating households who worked for any time during the reference week in those holdings. Further workers will be classified respectively into permanently, temporary and occasional according to as they worked more than  $1/2$ ,  $1/3$  to  $1/2$ , or less than  $1/3$  of the working time during respectively. Landless agricultural labourer working in the holdings but living outside the holdings will not be

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\*It is stated that a study-group appointed on comparability of Indian Census Economic classification 1901-1961 could not evolve any conclusive methods to secure comparability between the economic data of the 1951 and 1961 Censuses.

included. The data on employment will refer to just one reference week, and cover not only the persons worked but also the man hours worked.

41. In view of the considerable variation over the year, the F.A.O. has recommended in addition to the Census, successive sample surveys of agricultural holdings over the agricultural year in order to cover the employment activity during the different seasons. Presumably the surveys have to follow the procedure for collection of employment data as in Farm Management Studies.

### Labour Force Sample Surveys

42. It is clear that the decennial data on 'numbers' economically active should be supplemented by more frequent and periodic collection of data not only on the 'numbers' employed and unemployed but also on their "labour-time" disposition over the year. The idea is to survey the members of every household and collect from every person in the labour force, every day, for one full year, data on their current activity, and labour-time disposition. Obviously this is stupendous and almost impossible. The solution is sought through labour force surveys,

- (a) On a sampling basis (*i.e.*) by surveying a sample of households instead of all of them.
- (b) Taking a reference period or a week instead of a day for collecting data on current activity and labour-time disposition.
- (c) Staggering the survey uniformly over the year in order to cover the one year cycle.
- (d) Following the extended definition of the unemployed to include all those available for work, whether seeking work or not.

43. There has been considerable discussion on the standard reference period. It should not be too short like a day, as there will be undue fluctuations nor too long like a month to avoid errors due to recall lapses. On a balance of considerations, the week has been adopted following the general international practice. It is not short enough to get reliable data on the detailed activity over the period. Of course the data will have wider fluctuations as compared to those collected for a month but the procedure is to stagger the enquiry uniformly over the weeks of one full year.

44. Data are collected each day of the week on the labour time worked or on the job along with details regarding employment status, occupation, industry and extra labour time available for work.

45. Regarding the 'number' classification of the employed, and the unemployed, a priority scale following the international practice is adopted. The first priority is for the 'employed'. A person working even for one day in the reference week is considered as employed although the stringent international condition for a working day's normal work is not observed. The second priority is for those 'available' for work, and the rest are considered as not in labour force.

46. Empirical studies have shown that, on the basis of priority criteria for classification purposes explained above, the longer the reference period, the larger the estimated number of persons in the labour force and among them also the employed and smaller the estimated number unemployed. This is quite expected in view of the priority criteria followed.

47. In the developing areas, due to lower remuneration and thinning of work, workers may say that they will be available for work for unduly long hours and in such cases the question is what is to be done. A general practice has been to fix up a norm of certain number of hours of work per day. A person will be considered as available for extra work for the number of hours actually reported by the worker as available for such extra work subject to the condition that such hours should not exceed the difference between the norm and the hours of work actually put in by the worker. The N.S.S. have fixed with effect from their 11th Round, 8 hours of work per day in the organised sector and 10 hours of work per day in the unorganised sector respectively as norms and instructed that persons who have already worked normal hours should not be questioned about the availability for extra work. This raises a fundamental problem regarding the definition of normal hours of work, and the normal days of work for the month. But unlike developed countries or the organised sectors in the developing countries where norms like 8 hours a day or 40 hours a week are established, the norms in the rural areas will be very much determined by the exigencies of the agricultural operations during the different seasons.

48. It is clear that unless the whole year is covered no meaningful picture will emerge and the least that could be done is to

stagger the enquiry uniformly over the year. From the data thus collected the weekly average for the year as a whole is to be obtained. It is equally important to know the distribution of the activities, over the weeks of the year. This would lead to a further strain in sampling and call for ingenuity by way of partial replacement and rotating sub-samples to provide reliable enough estimates for both the annual average and the changes from season to season.

49. The classification by priority criteria is the best possible approximation, sticking on to the 'number' approach. What is intrinsic and fundamental, not depending on the choice of standard, reference period, or priority scale, is the quantum of labour-time worked and that of labour-time available over the year. Even then taking the year as a whole the quantum of labour time available and its distribution over the year gives only the extent of what is generally known as the 'visible' under-employment.

50. The visible under-employment thus determined represents only a partial picture. In view of the limited employment opportunities, which is a reflection of under-development, the workers, particularly the self-employed workers in agriculture and to some extent wage-paid workers too, spread their work thinly over time, as they have, except during the busy periods, plenty of time on hand having not much to do. There is generally a poorer time sense and the practice of intermittent working is quite common. These limitations lead to inadequacy or lower intensity of work even during the period of work, which is quite significant and is referred to by the ILO as invisible under-employment. Even so the visible under-employment is considered a useful concept and its measurement meaningful and of considerable interest.

51. As regards the invisible under-employment the ILO has sorted out the following specific factors :

1. The worker's job does not permit full use of his highest skill or capacity.
2. The earnings from employment are abnormally low.
3. The worker is employed in an establishment or economic unit whose productivity is abnormally low.

(1)-(2) are referred to as 'disguised' under-employment and (3) as 'potential' under-employment.

52. Although the ILO originally introduced these ideas in 1957 at the 9th Conference of Labour Statisticians, at the further

review for the 11th Conference (1966), the ILO has recognised that these factors are by no means mutually exclusive and exhaustive. Further it is difficult to determine the norms of skill or earnings and directly identify the potentially under-employed. The ILO's treatment is still guided by the sharp concepts functioning in the developed countries. As we have seen in the rural areas, the characteristics of under-employment are all a reflection of the overall under-development, its many economic and social facets—uneconomic holdings, poor capacity to pay wages, plenty of free time and the general practice of less intensive work over longer periods, social attitude to further work in general and in particular to specific types of work, institutional factors, etc.

53. Apart from the ILO, during the last two decades, economists have been studying the problem of under-employment, the labour time which could be supplied, the time actually worked, idle time available and the time that could be saved by working according to certain norms. They have taken under-employment as the difference between (1) the time the workers are available for or expected to work and (2) the labour time considered to be adequate on the basis of certain norms.

54. The subject has been studied mainly from the point of view of the agricultural holding and the household cultivating it. Thus it refers to the self-employed cultivators and the unpaid family workers, the labour time available from them and the labour time needed for the agricultural work. In certain studies instead of the time needed on the basis of an outside norms the time actually used is taken. In this case it refers only to the visible portion.

55. This has been further classified into disguised under-employment which is the difference between the time available for work and the time if they worked throughout the year at the rate at which they worked during the peak month of activity, and the balance as seasonal under-employment.

56. A further refinement made is to examine at the micro level, that is, cultivating household, and define that component of the available time which when added over the year amount to less than one complete labour unit disposable by the family as fractional under-employment, the underlying idea is that it cannot result in a surplus worker who can be entirely removed from agriculture. There can be further criteria for removability based on social

considerations whether the worker is the only male member, in which case he cannot be moved out, or woman member who may not be prepared to work outside etc. Only the balance after removing fractional under-employment is called removable under-employment.

57. An outstanding example of an actual study following the above concepts is that of J. P. Bhattacharjee "Under-employment among Indian Farmers—An analysis of its nature and extent based on data for Bihar" *Artha Vignana*. Vol. 3, No. 3, Sep., 1961. The paper seeks to present an analysis on the basis of objective measures derived from data obtained in the course of farm management investigations in Bihar in 1957-58. In the first place the distribution of working days in the different months of the year and the average length of working hours per day in each month are determined. Thus working conditions are taken into account in their reality. Next the number and composition of the working members in the household obtained, the labour hours they can supply, obtained separately for men, women, children and converted to a standard unit on the basis of certain equivalents. The total requirement of the farm is obtained from day to day observation of work of family members and those by hired labourers separately. The labour time thus actually utilised in the farm is taken as the time required and no further norm was determined or assumed. Labour hired out to other farmers or employed by the household members has been excluded.

58. Even with all these the question of a surplus labour force and its meticulous measurement, based on so many outside norms, and the assumptions of no significant change in organisation and production methods have been severely criticised by Gunnar Myrdal.<sup>21</sup> He questions the validity of the norms, not considering the social problems in physically removing persons from farms and the assumption that when they are removed the rest will work full time and keep up the production levels. On the other hand according to him and a more fruitful approach is to take note of the dynamic change, study empirically the nature of the employment generated through various policy measures and projects when injected into the main employment stream. In other words, according to Mr. Myrdal, "Much more intensive empirical research concerning the actual utilisation of the labour force in the various countries of the region and the conditions determining their work is needed to make our knowledge fuller and more concrete."

59. These observations are worth pondering over in the context of national planning in India with employment as one of the major objectives. The Commission, of course due to paucity of data, have to be content with expressing the employment position, including the backlogs, in terms of 'number' employed, unemployed, and the employment generation of projects in terms of full-time jobs.

60. It is clear there is increasing need through various types of data elaborated earlier, to assess the existing complex pattern of employment and the final pattern that emerges as a result of implementation of development programmes. As development proceeds the pattern must be not only fuller but more stable and rational.

61. Further considering the growth trends of the labour force in the urban and rural areas, coupled with rural urban migration, for some plan periods to come, it is obvious employment generated in the organised industries alone will not meet the situation. Continuous attention needs to be given simultaneously to the employment generated through small and village industries, rural work programmes and through the agricultural sector itself under the new strategy for agricultural development, for although the proportion of those engaged in agriculture may come down the absolute numbers must be increasing for some time to come. The employment studies should be directed towards this end in view.

62. Obviously all the data needs cannot be provided by a single source. As we saw already we need the Census of Population, Census of Agriculture, Sample Surveys of Labour Force with emphasis on time disposition, with a view to ascertaining not only the average weekly position for the full agricultural year but their distribution over seasons, and more studies in depth of the farm management type, based on daily observations of the farm activity and the farm workers over the whole year. All these studies should be encouraged, intensively studied and intelligently pieced together and a body of empirical experience built before rushing to any theory of labour surplus and precise measurement in sharp concepts of employment, unemployment and under-employment.

63. While some attention is being given to each of one of the several methods of collection, the 1970 Census of Population, 1970 Census of Agriculture, the labour force sample surveys of the N.S.S. and other agencies and the farm management and other type studies,

it is necessary to examine these together and coordinate them, from the point of the overall needs so that a body of integrated empirical data may be made available for a more realistic and detailed employment policy in the rural and in particular the agricultural sector, in the context of National Planning.

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