

STATISTICS FOR THE INDIAN AGRARIAN SYSTEM*

By

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1. INTRODUCTION

Mr. President, office-bearers, members of the Indian Society of Agricultural Statistics, delegates and participants of the 36th Annual Conference; distinguished guests, ladies and gentlemen; let me begin by expressing my gratitude and sense of privilege at being asked to deliver this address to-day. The gathering of scientists here knows that I personally have no background as an agricultural statistician, and I would like to believe that the Society, in extending this invitation to me, had possibly two objects in mind: firstly, it may sometimes be useful and curious to know the understanding of Indian agricultural statistics from a bystander to the field and, secondly, it would be a happy occasion to associate the Indian Statistical Institute with the activities of the Indian Society of Agricultural Statistics which, I believe, has not been of a frequent occurrence in the past.

As a relative outsider, therefore, I stand here with modesty and some trepidation to present before you certain formulations about the role of an Indian agricultural statistician. My address will necessarily be brief, because I cannot be presumptuous to make a long discourse to an audience more knowledgeable than myself.

2. THE INDIAN AGRARIAN SYSTEM

It is a needless statement that since agriculture provides nourishment to man and much material for his activities, even non-agricultural, it is a subject of importance and of general interest. For India this is all the more so because about 70 per cent of its people derive their sustenance directly from agriculture and related activities and these activities account for about 60 percent of the material production of the country. It is also well-known that after

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a long period of stagnancy, the performance of agricultural production has become dynamic since independence, both by way of volume of production and yield rate. On the other hand the increase of population has also accelerated with the result that per capita availability of food has at best remained stagnant, if not fallen.

The most compelling aspect of Indian agriculture has understandably been the means of increasing the volume of production, firstly of foodgrains and then of other crops and, as has been said above, significant achievements have been made. The most frequently emphasised purposes of these efforts are to make enough food available to people and to be self-reliant. During the not too recent past, however, much attention has been given to and much debate arisen about numerous interconnected aspects of the Indian agrarian system, the centre of attention being adequacy and self reliance in the volume of production.

It is interesting to note that the National Commission on Agriculture, which submitted its report in 1976, did have to devote a great deal of attention to all the multiple aspects of the Indian agrarian society, and not only to the question of agriculture and agricultural production in the narrow sense. In its report, which constitutes a mine of valuable information and contains many well-reasoned recommendations, the Commission has found it fit to consider and even cite some of the current debate on agriculture taken in many of its aspects.

Let me broadly enumerate the elements of the Indian agrarian system. It would be possible to make out a description in terms of Systems Theory, using the concepts of open and closed systems, subsystems and feed-back loops. However, that would require more thorough and painstaking effort and greater expertise in Systems Theory, and hence I shall try to describe the agrarian system in simpler terms. Although the description will be necessarily incomplete, yet it will bring out the complexity of the system and demonstrate to some extent that a real understanding of a part of it is only enriched and made more scientific with a knowledge of other parts and mutual interrelations.

To start with is the agricultural system proper in its narrow sense, *viz.*, in the sense of the system involved in the production of crops. Important elements of this system are:

- (a) Land—extent, nature of soil, types of possible crops
- (b) Climate and weather

- (c) Water—rivers, groundwater and irrigation
- (d) Crops—actual crops grown, acreage, yield rate, production
- (e) Cultivation and farm management practices
- (f) People in agriculture
 - (i) ownership of agricultural land and its distribution
 - (ii) distribution of other assets and income and capability of cultivation
 - (iii) relations of production among owners, cultivators, share-croppers, labourers, leasees and lessors
 - (iv) level of living, consumption, nutritional status.
- (g) Mechanism of exchange, trade and price determination: primary producer, intermediaries, final consumer, interplay of demand and supply.

In the countryside itself, the agricultural system proper is intimately connected with the following activities:

Animal husbandry

Fisheries

Forestry

Rural artisanship and manufacture.

Each of these activities would be composed of a list of important elements similar to that for agricultural activity, but this listing will not be attempted here. The overall socio-economic system of the countryside, englobing all the above activities, is composed of the property relationships, occupational structure, power relations, religions and caste groupings, etc., of the rural population.

The above describes in brief the "closed" agrarian system. But this system is open with respect to the non-agrarian (industrial, financial, commercial) systems of the country as a whole and even different aspects of the international economy. Government policy has become, since independence, an important factor in moulding all the above systems and subsystems, and hence must be constantly reckoned with.

There is a vast amount of valuable literature on different aspects of the agricultural system in the strict sense, the broader agrarian system and their interrelationships with the various non-agrarian systems. The most authoritative document which dwells upon almost all the aspects is the report of the National Commission on Agriculture.

Let me now narrate a few debated questions raised in this prodigious Indian literature on agriculture to show that systemic knowledge and understanding, rather than partial, are often called for.

3. SOME PROBLEMS OF THE SYSTEM

(a) *The new technology*

The "new technology" of agriculture, which has ushered in the green revolution, has been widely acclaimed and, as has been mentioned above, enhanced crop production. Nevertheless, many questions on the achievements and desirability of the new technology have also been raised and are still being hotly debated.

Essential elements of the new technology are multiple cropping, improved seeds, and application of chemical fertilisers. The cost of using the new technology has been found to raise the overall cost of cultivation rapidly, surpassing the rate of increase of yield obtained by its use. If one adds the cost of mechanisation, the relative input cost is even higher. It is a fact that the use of the new technology has not been universal and the contention is that this is bound to be so because the vast numbers of middle, small and marginal farmers cannot afford it. Some scholars say that the encouragement given to the adoption of the technology has necessarily widened economic inequality in the countryside, with undesirable consequences. It was expected that wage rates would increase with higher production, but some claim that this has not always happened. Some have even gone to the extent of claiming that production from the new technology is no longer rising, a plateau has been reached. If all these contentions are true, it would mean that the "breakthrough" in foodgrains production has come to a stop, that the farming community at large is not capable of extending its use further, and the country is at a dead end in the absence of an alternative policy. Where does the truth in fact lie? Are the acclaimed fruits of science and technology in fact useless for the Indian agricultural problems? One would be reluctant to believe it. If one goes through the writings, one notices that information on which several contentions are made are patchy, based on one or two case studies or on hasty observations. It is difficult for an unbiased mind to come to a definite conclusion. Suppose, for a moment, that many of the contentions are true. It would then be proper to look for another basket of prescriptions which would be less costly, be within the reach of smaller and less affluent farmers and be less likely to create increased economic inequality. Under favourable circumstances,

the Indian farmer has traditionally known the practice of multiple cropping. [For this and for other information about the Indian farmer's expertise as well as his difficulties, one may fruitfully refer to Dr. John Augustus Voelcker's report of 1893, which has been cited by both the Royal Commission on Agriculture of 1970]. As regards inexpensive fertilisers, I always recall the lifelong but fruitless campaign of the eminent scientist Dr. N. R. Dhar, for the use of organic fertilisers. From my childhood days till about a year ago, I have heard him propagate the benefits of these fertilisers, but it seems that Scandinavian countries have been more receptive to his ideas than our own country. We all know the difference in yield rate between irrigated and unirrigated land for the same crop. The range between minimum and maximum yield rate from irrigated land is distinctly to the right of the same range for unirrigated land. People have found flaws in HYV also. They require too much of fertilisers, they are not resistant to pests, they do not have enough stalk length or strength to provide the byproduct of strong straw needed for roof thatching. Experiments have been made to evolve moderately high yielding varieties (MHYV !) which, as is claimed would not have these drawbacks. Therefore, if multiple cropping, organic fertiliser, irrigation and MHYV is advocated as a new technology package, would it result in greater acceptance, achieve the same total production and avoid increasing economic inequality? It is quite certain that there would be advocates for and against. The fact of the matter is that there is just not enough evidence. What is very unfortunate is that this kind of debate is based on different sets of factual, empirical information. On the same set of data on which there is not disagreement one can use different techniques under different assumptions and may come to different conclusions, and there can be a scientifically based debate. But if the data base of one side is different from or not acceptable to the other, there can only be interminable polemics. Reflection will show that in order to have a meaningful dialogue on the above problem it is necessary to have a substantial amount of interconnected data on yield, production, inputs and their costs, wages, distribution of holdings, as well as experimental data on the use of different kinds of fertilisers, which we do not have.

(b) Land reforms

Let me discuss a second question. Land reforms have been an accepted tenet of Indian polity and Governmental policy since independence. By land reforms one usually means only redistribution of land to reduce the inequality in the size of land owned. If

the guiding principle behind it is that more people should have private property in the form of land, without any other desired results to follow, there is no quarrel. However, land is, after all, capital from which production is expected and there comes the difficulty. A view is often taken that if a farmer owns the plot he tills, he has greater enthusiasm and incentive, and hence he produces more. On the other hand, when land is distributed many farmers tend to have uneconomic holdings, they cannot afford expensive inputs, and hence aggregate production would fall. Those who are advocates of the first view show results of studies that, under the same conditions, yield rate is neutral to size of the operational holding. The other side argues that between a large and a small landholder, conditions cannot be the same. After all, let us not forget the fact that the USA, whose power in the world grain market is so formidable, has an average farm size of over 200 hectares. In India, State Governments which have tried to act true to the principle of land distribution, have operated a policy of providing loans to small farmers. These latter have often found the loans inadequate to buy inputs but enough to buy their consumption necessities. They are therefore indebted and are still burdened with uneconomic holdings. Is the country on the horns of a dilemma? A policy of large holdings which would be capable of using expensive inputs to increase productivity might imply an increase in the number of rural unemployed and dispossessed who have no prospects of finding remunerative work in the non-agrarian system. A policy of serious land redistribution leads to a multitude of small farmers bereft of the means to increase productivity. Are the facts behind these positions correct? Unfortunately, again, there are partial and contradictory facts and no set of substantial, well-organised and inter-connected facts to make a judgement.

(c) *Agricultural income tax*

Whether or not to introduce a system of agricultural income tax has for long been an issue of lively debate. Recommendations that this should be done have been made by several economists, and even by the K.N. Raj committee appointed by the Government, but the latter has so far not been able to make up its mind. Let us remember that the whole of agriculture, in the sense of producing crops, is in private hands, unlike several other production activities which are either partly or wholly public. At the same time, if one has faith in estimates, public outlay on agriculture is perhaps more than double the total private outlay. There are some factual questions which need more detailed information than is available.

This would include the evaluation of individual or household assets and money income, the amount of self-consumed agricultural product and marketable surplus, the producer's price and market price, etc. If detailed and reliable information covering the different regions of the whole country were available, a judgement could be made on the number and income (or asset) level of farmers who could legitimately be taxed without jeopardising their consumption or production activity, the amount thus expected to be gained by the public exchequer, etc. The rural trading income would have to be given importance because the income accruing to the intermediaries and traders due to the wide difference between producer's price and final market price is believed to be large for many crops. Unfortunately, those who have an acquaintance with data on the above subjects know their inadequacy.

(d) Terms of trade between agriculture and industry

There are some studies on the relative rates of growth of agriculture and industry, the advantages to these sectors due to terms of trade, namely, again the relative rates of price increase which determine the advantage or disadvantage of transaction of one sector with respect to the other. There are exponents of either side in this subject. It is easy to see how the question of taxation of income is also related to the terms of trade. It is important to know accurate facts and have correct interpretations to determine a fair public policy of investment, subsidies and taxation. As far as can be gathered from literature, there is no definitive set of facts or analyses which could help in the formulation of a unique policy, even ignoring political ideologies which play a substantial role in this area.

The four examples crudely sketched above, and which can be multiplied, lead to the conclusion that sustained data-building from a systemic viewpoint for the agrarian system, and their constant analysis on the basis of an understanding of the total system are essential.

THE ROLE OF AGRICULTURAL STATISTICS

So far most of the work relating to the above and similar problems, although very rarely from a systemic approach, has been done by economists. However, it can be seen by looking at the components of the agrarian system that what is needed is an overall understanding of the system formed by some knowledge of a meteorologist, a water specialist, an agronomist, an economist and a sociologist. It is my contention that the statistician is in a unique position to perform this integrated role because he is already engaged in separately helping these disciplines with data and analyses.

It is well known that the Indian contribution to agricultural statistics has been great and is acknowledged in the entire professional world. This contribution has been the most significant in crop surveys and the design of experiments used in agriculture and animal husbandry. There has also been some contribution to the genetics of plant and animal breeding. These are laudable, but the statistician has never assigned to himself any more than purely statistical tasks, which makes his role secondary to other substantive professionals. Nor has it occurred to anyone to ask from the statistician a total picture of the Indian agrarian system and analytical conclusions on the basis of given assumptions and hypotheses. Even the National Commission on Agriculture which, as has been noted above, has examined the entire agrarian system, assigns very few new tasks to statistics in its 86 recommendations on the subject of agricultural statistics.

It is not that the statistician is satisfied with the subsidiary role of a supplier of data and a routine analyst, he does make a claim to be a consultant in policy and decision-making. Let me quote from the report of the Committee to Review the National Statistical System (1980) :

“Statistical offices can be involved in the decision making process in the following spheres :

- (i) Policy formulation by various departments concerning their subjects;
- (ii) Development planning and overall economic and social policy formulation by the Government; and
- (iii) Statistical operations which include decision about collection, processing and interpretation of data.”

These claims are further elaborated in the report and it is complained that the policy and decision making role is assigned to economists, and statisticians are not considered for this task.

My submission is that the fault does not solely rest with those who assigns the tasks. In general, there is a tendency on the part of the statistician himself to restrict his role rather than expand it in the manner which I have mentioned. If it had been true that a substantial number of statisticians at a senior level, engaged in agricultural statistics, had acquired an understanding of the interconnected agrarian system and, with the expertise available with them produced analytical material, say, on the four important subjects mentioned

above, the capabilities of the statistician would have been perceived in a different way and due recognition would be easier. We have a few great exceptions which need to be emulated. The late Professor Mahalanobis became a planner and was acknowledged as such not because he provided data and their statistical analysis but because he achieved a comprehension of the economy of the country and proposed a framework of description and development of the system. More recently, Professor Sukhatme has decided not to confine himself with routine or even innovative analysis, but engaged in the science of nutrition itself, including laboratory experimentation and demonstrations. Today anyone concerned with a nutrition policy will have to reckon with the presence of Professor Sukhatme not because of his work and reputation in statistics but as a scientist of nutrition.

I therefore propose the following tasks for a statistician of the Indian agrarian system :

- (a) Study the essentials of Systems Theory
- (b) Make a comprehensive inventory of the components of the Indian agrarian system as a closed system and also the broad components of the non-agrarian systems to be able to consider agriculture as an open system.
- (c) Form groups of components which would form sub-systems of the agrarian system.
- (d) Draw up a systems diagram with blocks of components and interconnection of flows.
- (e) Examine the existing data base to see if adequate, reliable and recent information is available for the compound and their interrelationships.
- (f) Try to fillup the data gaps.
- (g) Study some of the problems of the type mentioned above and try to understand them from the systems point of view.
- (h) Publish analytical work written on the above basis.

This is way of looking at the agrarian system is not only somewhat new, but is also likely to provide a more realistic and well-founded understanding of the specific problems. Agronomists, economists, meteorologists, hydrologists, sociologists, all have special leanings towards their disciplines and would often look at problems

from their specialised optics. Statisticians, on the other hand, should be capable of looking at all these aspects conjointly without an *a priori* penchant for one and, with his training and expertise in data collection, processing and analysis, should be able to produce good pieces of integrated work. What I am advocating is not altogether new. The International Institute for Applied Systems Analysis situated in Austria is already trying to look at the food problems of India from the systems point of view and some of our Indian colleagues are working on it. Taking the Indian agricultural statistician community as a whole there is no reason why a much more comprehensive and reliable framework cannot be drawn up.