Whither Agricultural Statistics?

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SUMMARY

For implementing appropriate food policies, there was need to objectively determine food surplus and deficits in each province and for which concerted efforts were made for putting the system of collection of basic Agricultural Statistics on a sound footing. Standardisation of forms, concepts and definitions as well as training programmes at various levels were made for data improvement. The random sampling technique evolved by Prof. Sukhatme was adopted for estimation of yields of both food and non-food crops. The paper discusses the changes introduced over decades like TRS, ICS, EARAS, Agricultural Census etc. The factors responsible for steady deterioration of agricultural statistics in the nineties are highlighted alongwise the measures for improvement to bridge the data gaps. To meet the challenges ahead, there is need for formulation of environmentally sound and sustainable Agricultural Development programmes, strategy for rural welfare and economic liberalisation. The paper advocates not only to stem and reverse the current deteriorating trend in collection of agricultural statistics but also to generate new types of data.

Key words : Basic agricultural statistics, Data gaps, Quality data, Resource inventory data, Ecological factors, Resource management.

1. Introduction

The author's first employment was in January 1945 with Dr. P.V. Sukhatme, when he was the Statistical Adviser to the then Imperial Council of Agricultural Research. About a year-and-a-half later, Dr. Sukhatme and Dr. W.R. Natu, then the Economic and Statistical Adviser to the Department of Agriculture decided to entrust the author with larger responsibilities and he was shifted to the Department. There his new duties included taking steps to ensure adoption by the provincial governments of the methodology of statistical improvement schemes developed at the ICAR, and enabled him to stay in close

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1 The author retired from the Government of India in 1980. During his service he held several key positions, such as the Economic and Statistical Adviser to the Ministry of Agriculture; Member-Secretary, National Commission on Agriculture; and Chief Executive Officer, National Sample Survey Organisation. He also worked as Research Fellow at the International Food Policy Research Institute, from where he retired a second time in 1988.
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touch with Dr. Sukhatme. This formal association continued until 1951, and it is during this period that the foundation for a sound system of agricultural statistics was laid in India by Dr. P.V. Sukhatme and Dr. W.R. Natu. Looking back, he is proud to have been associated with the crop-cutting survey methodology of statistical improvement schemes that was being evolved those days. Subsequently, he was privileged to have worked with Dr. Sukhatme in a variety of forums.

2. *Laying the Foundation*

There were several reasons why in those days concerted efforts were made for putting the system of collection of basic agricultural statistics on a sound footing: First, after the separation of Burma during World War II and later after Partition, the country was plagued by severe food shortages. For implementing appropriate food policies the need for reliable and timely data on foodgrain production and availability was keenly felt. The food shortages were met by procuring foodgrains from surplus areas and pooling with imports, distributing in the deficit areas through a system of rationing and fair price shops. Clearly, there was need to objectively determine food surpluses and deficits in each province.

Second, with the ushering in of the Planning era in the 1950's, the demand for basic data on agriculture, such as land use, area and production of crops, irrigation, input use and prices arose. Crop production data available at that time were based on subjective estimates which needed to be replaced by objective estimates. The evolution of large scale crop-cutting surveys based on random sampling method enabled the determination of such objective estimates. In this, we were fortunate in having the benefit of Dr. Sukhatme's expertise: his own work in the UK was research in the statistical theory of sampling entitled "Contributions to the Theory of Representative Method" under the guidance of eminent statisticians J. Neyman and E.S. Pearson. Earlier also this Provincial Revenue and Land Records Departments conducted some crop-cutting experiments for determining representative crop yields to be used for settlement purposes. Dr. Sukhatme thought it was best to operate through the existing system but use modern random sampling techniques. Incidentally, it may be noted here that the method developed at the Indian Statistical Institute under the guidance of Professor P.C. Mahalanobis was different from that developed by Dr. Sukhatme in several respects; for example in the choice of the primary sampling units, and in the shape and size of the plot for crop-cut. Ultimately, it was the methodology developed by Dr. Sukhatme that came to prevail.

Third, at the time of Independence, there was a lot of heterogeneity in the concepts and definitions for various basic data and the forms in which these were collected. For example, the different temporarily-settled provinces and many of the princely states did maintain land records, which provided basic information on land utilization, area under different crops, sources of irrigation and so on. However, the proformae in which the data were collected and maintained varied substantially. For example, in the Bombay Presidency, the Khasra Register was maintained in the form of a loose-leaf register with provision for recording ten-years data on each page. In most other Provinces, the register was kept in a running form, with provision for four or five years' particulars, by season. In the Madras Presidency, land use and crop data were recorded on a monthly basis. The definitions adopted for major terms like fallow land, current fallows, normal yield, condition factors also varied widely from province to province. These were required to be made uniform and comparable. The various proposals for standardisation of forms, concepts and definitions were considered by the Technical Committee on Coordination of Agricultural Statistics, which included, among others, Dr. W.R. Natu as Chairman, Dr. P.V. Sukhatme as member, and the author happened to be the Secretary. The Committee submitted its report in 1949, which formed the blueprint for data improvement over the next several years. To ensure uniform adoption of definitions, a two-stage training programme was imparted to patwaries and the supervisory personnel. In the first stage, tehsildars and naib-tehsildars were trained at the Institute of Agricultural Research Statistics (IARS) at New Delhi, who in turn trained the local patwaris and kanungos in the respective states. This effort at standardization-spear-headed by the IARS under the leadership of P.V. Sukhatme was a crucial pre-requisite for developing national-level aggregates.

These efforts naturally placed large additional demands for trained statisticians for the implementation of various statistical improvement schemes. These were met through the training programmes at various levels organised by the Statistical Branch of the ICAR.

3. Changes over the Decades

Over subsequent decades, several other improvements in the basic system of collection of agricultural statistics were made, and it is useful to review the more important of these briefly. Through the 1960's, crop-cutting surveys were extended to non-food crops such as cotton, jute and the oilseeds. The compilation of derived statistics such as the index numbers of agricultural production and growth rates in agriculture was initiated during this period as well. Towards the end of the 1960's the Timely Reporting Scheme was

introduced to improve the reliability and timeliness of land utilization and crop area statistics. Steps for expansion in the scope and improvement in the quality of information on prices of agricultural commodities and market intelligence were also taken around this time.

The 1970's were generally a period of consolidation of surveys already in operation. The major new scheme undertaken in this decade was the first agricultural census, based on a retabulation of land records, undertaken in 1970/71. The Farm Management Surveys, conducted since the mid-1950's began to be replaced by a comprehensive scheme for studying the cost of cultivation of principal crops in different regions. Further, two schemes: one for Improvement of Crop Statistics (ICS) providing for supervision of crop-cutting surveys by the field staff of the National Sample Survey Organisation and another for the Establishment of Agency for Reporting Agricultural Statistics (EARAS) in non-land record states were also started during this period.

In the 1980's there was some stagnation in the availability of agricultural statistics. In particular the implementation of the recommendations of the National Commission on Agriculture and of the various Five Year Plan Working Groups on improvement of agricultural statistics did not receive the attention due to them. In the 1990's the situation seems to have deteriorated further. The basic data became available only after a considerable time lag. Moreover, there were substantial revisions in the crop production estimates between the announcement of the 'preliminary', 'final', and 'revised' figures.

Several factors were responsible for this deterioration: The relevance and importance of land records declined. More importantly, perhaps, after the attainment of self-sufficiency in foodgrains in the mid-seventies and the improvement of the food situation thereafter, less attention is being paid to timeliness and reliability of foodgrain production statistics.

Another constraint is funds. It is the common experience that whenever there is a constraint on budgets at the Central or State government levels, the axe invariably falls on the financial provision for agricultural statistics. No new schemes are taken up and existing ones discontinued. Worse still, the recurring schemes are starved of funds. Since staff salaries are to be paid anyhow, including the periodical upward revisions in the form of dearness allowances, the provision for traveling and daily allowances is reduced often, resulting in curtailed supervision and even field work. Even the financial provision for equipment gets cut-no provision is made for replacement of worn out equipment such as weighing balances, measuring rods, tapes and so on. Consequently, field staff frequently conduct crop-cutting experiments some how without these. This situation prevails even today in several areas.

An allied problem is that of printing of forms and returns. As private printing is more expensive, these are often required to be printed at Government presses which are often busy with work of higher priority. Data collection suffer as a consequence.

Further, where field work away from headquarters is involved, the travel conditions have become more difficult, with overcrowded buses and trains, and few facilities for the investigators to spend the night in the village. The respondents-be they farmers or others-are busy during the day time, and investigators find it difficult to obtain information. But since forms are to be filled in, these are done somehow. The supervisors also face similar problems, and their sympathies are with the primary enumerators. This gives rise to perfunctory supervision but both the investigator and the supervisor are happy. The reliability of data suffers.

Undue expansion of field work also often affects the quality of data. When crop-cutting experiments covered the principal crops and estimates were required at the state or regional levels, the data were reasonably reliable. But when the surveys were extended to a large number of crops without a commensurate expansion in field agencies, or when estimates of output were required at the block level for decentralized planning or for the crop insurance scheme, the system collapsed under its own weight.

These reasons, taken individually, seem trivial. Taken together, however, they result in an increase in slip-shod work, which has become apparent. It is not easy to reprimand a worker who produces shoddy data-as every supervisor realises. There is no comfort to be derived from the realization that when there is general deterioration in government administration, statistical services are no exception.

Several instances can also be cited regarding data gaps. The author recently referred to a glaring gap in current statistics of foodgrains used as livestock feed. To arrive at the net availability of foodgrains from the gross, a constant allowance of 12.5 percent is made for seed, feed and wastage-a practice that has continued since the 1950's. This introduces anomalies in the time series data on per capita availability of foodgrains (Sarma [6]).

Pointed attention to specific deficiencies in the available agricultural data has been drawn several times, by, for example, the Seminar on Data Base of Indian Economy [3], the National Commission on Agriculture [2], Working Group on Agricultural Statistics set up under successive Five-Year Plans, and other Committees. An analysis of the reports of the Timely Reporting Scheme made by V.R. Rao [4], revealed a disturbingly-high degree of irregularity in

data collection operations in a scheme which is being implemented precisely to remove the defects in the data. His suggestions to improve its performance were (i) reducing the workload of patwaris; (ii) according high priority to crop inspection in patwari's functions; (iii) frequent supervision by higher level revenue officials; (iv) regular refresher training to the patwaris and supervisors. These suggestions are not entirely new, but these have not been implemented. Rather, instead of implementing the recommendation made by several Committees and Commissions that the workload be reduced, more work was entrusted to the patwaris in connection with the rural development programmes.

Clearly, the situation will improve only when there is adequate pressure from users of the data. The major users of the crop production data are Government agencies (such as the Department of Agriculture, Food and Civil Supplies, Commission on Agricultural Costs and Prices, to name a few) who often do not question the data. Other users include researchers, who may point out data gaps, but are hardly in any position to demand better quality data. Major commercial organizations including the traders and manufacturers associations have access to their own data sources, and hardly depend on the official data because of the delay in their availability, among other causes.

4. Challenges Ahead

But things are changing. India is now gradually moving from a centralized planning system towards indicative planning. Experience of implementation of successive Five Year Plans has also shown the need for decentralized planning particularly in the agricultural sector at the level of agro-climatic regions and watersheds, which demand disaggregated data at these levels. At the same time increased attention is being paid to *sustainable* agricultural development, with environmental concerns explicitly entering in the formulation of projects and programmes. These emerging needs will only impose greater demands on reliable data on a timely basis at more disaggregated geographic levels.

Specifically, greater emphasis than at present is needed on Resource Inventory Data, and Forecasts and Outlook Reports. For example, time series data on resource degradation on privately held lands along with matching socio-economic data are required for formulating environmentally-sound and sustainable agricultural development programmes. Resource degradation occurring on government lands and on common properties also needs to be documented. Ensuring sustainability of agricultural development means that ecological factors such as soil, water, forests and climatic variables be constantly monitored, in addition to tracking changes in productivity. Mutually consistent

data are also required on resource management, perhaps collected/collated from secondary sources.

Further, with the attainment of self-sufficiency in foodgrains, a three-pronged strategy for rural welfare, comprising crop-intensification, diversification and value added, needs to be adopted (see for example, Swaminathan [7]). This implies that additional information on net income per unit area and per unit of water from a variety of horticultural crops, for example, is needed. Policies for integrated plant nutrient supply and pest management are also essential to obtain optimal results. These decisions would need to be based on appropriate studies involving economic factors as well.

Another area which will place fresh demands on agricultural statistics arises out of the process of economic liberalisation, freeing the economy gradually from unnecessary controls and regulations, withdrawing state intervention and subsidies and opening the economy for global trade and commerce. Under the liberalised market economy, reliable information on each of these aspects is required.

It is not difficult to enumerate the kinds of information that will be needed in the future. Suffice it to say that it thus becomes imperative not only to stem and reverse the current deteriorating trend in the collection of agricultural statistics, but also generate *new* types of data. This will clearly demand additional resource allocations.

For providing the bulk of this information, it would be necessary to consider afresh the types of data already being collected at present and to organise an integrated programme of censuses and current surveys in agriculture. It may be pertinent to note here that proposals for such surveys were considered by the Statistics Advisory Committee of the Food and Agriculture Organisation of the United Nations in the early seventies. These proposals were published in the FAO Monthly Bulletin of Agricultural Economics and Statistics [5]. A phased five-year programme was suggested with one set of surveys with "field" as the unit and the other with "operational holding" or "household" as the unit. The National Commission on Agriculture also endorsed these proposals. Further, some of the data listed in these proposals are already being collected as part of the National Sample Surveys, and the annual crop surveys. Of course, these proposals need to reviewed in light of new data needs.

As a remedy for the existing situation in which bulk of the data are generated by the government, some have argued for the privatisation of the data collection process. However, entrusting this work to private agencies is not always an unmixed blessing; experience in the past with data put out by commodity traders and manufacturers associations has shown that these data

are not altogether unbiased either. What is more important is that a system of consistency checks and balances be evolved. Similarly the suggestion to replace objective methods of crop estimation by subjective methods involving collection of crop data through enquiry from the farmer is not desirable.

Two developments augur well for the future. The first is the use of remote sensing techniques which can be used increasingly for making crop forecasts. The second is the electronic revolution which should enable quicker data processing and dissemination of results. How well these are utilised is a question that remains.

Noise is also made from time to time regarding the defects in the available agricultural statistics in a variety of forums. The undisputed fact, however, is that those at the decision making level who are responsible for facilitating their improvement are not committed to it. Such commitment and-perhaps equally important-accountability are required for implementation right from the primary level of village accountants and field investigators, up to the highest levels of data analysis and interpretation. One may feel happy to note that there is now renewed interest in some of these issues in the context of reconciling apparent discrepancies between different estimates of poverty rates, and so on. Things will only improve when the cost of not having the right type of information at the right time is realised by data users-be they private or public agencies.

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