

# SYMPOSIUM ON PLANNING OF AGRICULTURAL CENSUS IN DEVELOPING COUNTRIES

A symposium on "Planning of Agricultural Census in Developing Countries" was held at the 22nd Annual Conference of the Indian Society of Agricultural Statistics in Patna on December 16, 1968 under the Chairmanship of Shri S.C. Chaudhri, Member-Secretary, Agricultural Prices Commission, Government of India. Introducing briefly the papers received for the symposium and the speakers participating, the Chairman suggested that the topics might be taken up in the following order : (i) scope and coverage of agricultural census in developing countries and concepts and definitions involved, (ii) methodology, (iii) agricultural census and agricultural planning, (iv) agricultural census and land reforms, (v) experiences of census-taking in developing countries, and (vi) usefulness of agricultural census for formulation of price policies. He also expressed his appreciation of the work done by Shri R. Giri, as Convenor of the symposium, in organising it. The speakers were thereafter called.

## R. Giri<sup>1</sup> : Scope, Coverage, Concepts and Definitions.

The title for the symposium would suggest that the scope and coverage of the agricultural census in the developing countries have to be determined in a manner that would provide the data needed for planning and executing programmes of agricultural development. In most of the developing countries, particularly those in Asia and the Far East, agriculture is carried out in numerous small farms which constitute not only operational units but also decision-making units. Detailed data on the structure of agriculture, are, therefore, needed for different types of farms defined on the basis of their resources; pattern of utilisation of these resources, potentialities for better utilisation of resources, application of various inputs, and output response. The planning process in most developing countries visualises preparation of development plans for units smaller than a district or a sub-district (tehsil). Agricultural census in these countries has thus to be planned such as to provide estimates at the level of these planning units.

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### Scope and Coverage :

The 1970 World Census of Agriculture should contemplate for each country collection of reliable and comparable information on the structure of agriculture. The items of information should cover (i) number of agricultural holdings and their principal characteristics such as size, form of tenure, land utilisation and whether the holdings produce mainly for home consumption or for sale, (ii) area under crops and production of principal crops, (iii) livestock population and quantities of principal livestock products raised, (iv) farm population and its characteristics, (v) nature and extent of employment in agriculture, (vi) transport facilities available and agricultural machinery owned together with their use under different arrangements, (vii) irrigation and drainage, (viii) use of fertilisers and soil dressing, (ix) wood and fishery products raised on agricultural holdings, and (x) the extent to which agriculture is associated with other industries.

The exact form of the questionnaire would naturally vary from country to country in accordance with local conditions. In the interest of economy, facility of administration and accuracy of essential items, it might be necessary in some countries, particularly in those which do not have sufficient experiences in conducting the agricultural census, to restrict the scope of the census to major items only. The FAO Programme for the 1970 World Census of Agriculture, therefore, visualises two lists of items, namely, (i) Short List covering the items of major importance in world's agriculture for which data are desired from all countries, and (ii) Expanded List containing items which are primarily of regional importance or provide detailed breakdown of items in the Short List, on which some countries may be able to collect information through the census.

The agricultural census should conceptually cover all types of agricultural holdings, whether producing primarily for sale or for consumption by the holder and his family. Tribal and other groups which are outside the normal marketing system, have also to be included in the census. The census has to include all agricultural holdings, irrespective of their size and location in rural or urban areas. On practical considerations, the complete enumeration may be limited to those holdings which conform to certain recognised criteria and which fall above certain lower limits as to size of holding, or size of operation, or both. No uniform minimum limits in terms of area, volume of production, number of livestock or number of trees can be suggested, because these vary from country to country.

But in view of the large number of small holdings in many countries and their sizable contribution to the production of some of the important foods, it would be desirable that the minimum limits should be as low as possible. For holdings below the minimum size excluded from the census, special surveys should be conducted to estimate efficiently the main census items.

### **Main Concepts and Definitions :**

For the purpose of agricultural census, a holding is defined to include all land which is used wholly or partly for agricultural production and is operated as one technical unit by one person alone, or with others, without regard to title, size or location. The holding may consist of one or more separate parcels, located in one or more territorial divisions, provided that all the parcels form part of the same technical unit. The holding may be known as a lot, piece or parcel of land, garden, orchard, vineyard, estate, ranch, plantation, rural establishment, communal establishment or by some other name. Establishments and other units producing livestock or livestock products with or without operating any land, are also included in agricultural holdings. A technical unit is the unit which, under the same management, has the same means of production, such as labour force, machinery and animals.

Agricultural production may be defined for purposes of the census to include the growing of field crops, fruits, vines, nuts, seeds, nursery of these crops, bulbs, vegetables and flowers both in the open and under glass, production of coffee, tea, coconut, rubber, etc., and production of livestock and livestock products, poultry and poultry product honey, rabbits, fur-bearing animals, silk work, cocoons, etc. Forestry and fishery production carried on as an ancillary activity on an agricultural holding is also considered as agricultural production. Land used in common for grazing purposes by livestock kept by holders in the proximity of their holdings forms communal grazing land holdings, provided the area is delimited by fencing, etc., and supervision is exercised in regard to the use of the land.

The holder, for census purposes, is the person who has the responsibility for the operation of the agricultural holding and exercises the technical initiative and responsibility for the operation of the agricultural holding and exercises the technical initiative and responsibility for the operation of the holding and may have full economic responsibility as an owner for it or share this with others

who may be tenants. When two or more persons share jointly in the economic and technical responsibility for the operation of an agricultural holding, each has to be considered as the holder if they belong to different households. If, however, the persons jointly operating the holding are members of the same household, one of them should be considered as the holder and all information should be supplied in relation to this person.

For purposes of the agricultural census, land tenure is defined in terms of the rights under which the land is operated, and in terms of ownership of the land. The land may be held by a holder either as an owner (which means that the holder possesses title of ownership and consequently the right to determine the nature and extent of its use as well as the right of transfer), or in owner-like position (which means that the holder operates the land in an-owner-like way even though he does not possess a title of ownership). The owner-like possession may include: (i) land operated under perpetual lease, hereditary tenure and under long-term leases, (ii) land which has been operated uninterruptedly by a holder for a long period without payment of rent and over which the holder has no legal title of ownership nor has he obtained any long term lease, and (iii) communal land or tribal land which a holder receives rent-free and retains it as long as he keeps it under cultivation by his own or his family labour without the right for sale or mortgage. The area rented has to be classified according as it is rented for (a) fixed amount of money, (b) fixed amount of produce, (c) fixed amount of money and some produce, (d) exchange for services and other services and others including the area operated rent-free, and (e) share of the produce or its equivalent in money.

The type of a holding is determined according as it produces mainly for home consumption or mainly for sale. The holdings producing mainly for sale are further classified by most important types of agricultural production, such as crop holding, or livestock and poultry holding, according as 50% or more of the value of the sales is from the sale of crops or sale of livestock products and poultry. A holding is said to be a mixed holding where none of the above accounts for more than 50% of the value of sales. Rest of the holdings can be grouped under others, such as silk work holdings, bee-keeping holdings, etc., which belong to none of the previous groups.

D. Singh<sup>2</sup>. Agricultural Census Methodology.

In the classical sense the distinctive features of the census methodology can be summarised as follows : (i) universality of enumeration ; (ii) simultaneity of enumeration ; and (iii) singleness of method. The meaning of universality is clear : a census with universal enumeration is often called a complete enumeration census. By simultaneity is meant the principle that census, data must refer to the same point of time, although the real process of enumeration takes a somewhat longer period. Singleness of method is reflected in the use of the same method in collecting data and tabulating them. By and large, census of human population, census of housing units, census of industrial units, etc., conform to the methodology enumerated above. In the case of agricultural census, it becomes imperative to deviate from the classified approach.

There can be a difference of opinion on whether the agricultural census should be conducted on complete enumeration basis or on a sample census basis. The choice would, however, depend on the level at which the data are needed in a country. If the need is for data for small administrative unit, a complete count is obviously called for. If, however data for larger administrative units like divisions or states would do, sample census may serve the purpose. In the case of developing countries like India, as already mentioned by the previous speaker, basic agricultural data are needed at present at Community Development Block level, or, some times even for individual villages, for preparing agricultural production plans. Hence, it is imperative to have a complete count of all the agricultural holdings. There is an added advantage in doing so. The frame and the basic information collected through the agricultural census would be useful for planning current agricultural surveys for collection of data on various aspects of agricultural economy. Such surveys could be efficiently designed if the basic frame of sampling units for drawing the sample and other relevant information for the purpose of stratification and for improving the method of estimation are readily available. This is feasible only if there is a complete count atleast for minimum items.

The concept of simultaneity of enumeration does not work in agricultural census as it does in other censuses. Agricultural census items have generally been grouped into three : (i) those for which

reference period is a day ; (ii) those for which reference period is a week ; and (iii) those for which reference period is a year. It is a moot point whether reliable data on items, for which reference period is a year, could easily be collected by making an enquiry only on the census day. Experience has shown that data on such items, particularly in the developing countries, could not be reliably collected through the interview technique ; it becomes necessary to spread the enquiry over the year and even adopt physical counting. For illustration, to obtain data on crop or livestock production, it will not be appropriate to confine the enquiry to a day and obtain the data by interview method. Similar problem will have to be faced for collection of data on employment in agriculture. Obviously, data on items for which reference period is a year, and method of collection is objective measurement, cannot be obtained on complete enumeration basis ; appropriate sampling methods in such situations will have to be employed. Even for some items for which reference period is a day, the method of obtaining the data by interview may not be universally recommended. Experience has shown that farmers are not able to give correct information on the number of fruit trees by interview method. Similar is the position if data on livestock numbers are needed according to various categories of animals. In such situations, physical count becomes, at least in a sub-sample of units, essential.

Thus the agricultural census items need to be suitably grouped. For some, reference period may be a day or a week and data on such items should be collected on complete enumeration basis ; for others, for which reference period happens to be a year, sampling methods should be adopted. Physical counting or objective measurement should be resorted to on sampling basis in cases where it is known that reliable information cannot be obtained by interview method.

For classifying the items and for determining the appropriate method for collection of data, it will be necessary to plan a pilot census. The pilot census could also be utilised for determining the concepts and definitions to be adopted in the agricultural census. Such pilot census could provide guidance for fixing the number of field staff of various categories. So far as India is concerned, the existing land record agencies, wherever they exist, could be fruitfully utilized for conducting the agricultural census. It would also be useful to make a careful study of the existing land records maintained at the village level to examine how they could be utilized for culling out data for the agricultural census. It is believed that these records will be

of immense value for determining the size of the operational holdings and their characteristics, and for providing a frame for organizing a sample survey, if data on some items, as mentioned earlier, are to be obtained on sampling basis.

The conduct of agricultural census will be a stupendous task as such; preparations for achieving the objective envisaged under the agricultural census programme should start much in advance of the actual date of agricultural census taking. In fact, most of the countries have already started preparation for the 1970 agricultural census by organizing pilot censuses for determining the concepts and definitions and for testing the schedules to be used in the census proper. If such a census is to be conducted in India, an organization should be set up immediately for undertaking the necessary studies for finalising the concepts and definitions and methodology to be adopted in the 1970 Census of Agriculture.

R. P. Saha<sup>3</sup> and S.B. Pillai<sup>4</sup> : Some Observations on Planning of Agricultural Census in India.

Under the auspices of the FAO, World Censuses of Agriculture were organised in 1950 and 1960. Again the FAO has initiated a programme for the 1970 Census. FAO has suggested in this programme complete enumeration or sample survey or a combination of both for the collection of data. Complete enumeration—according to the FAO, may be necessary only in those countries where census figures are to provide bench-mark information for current agricultural statistics or where regional planning demands data for small administrative units. India had participated in the programme of the last two Censuses by organising sample surveys. Besides meeting the requirements of the FAO, the past enquiries in India were also designed to serve the national needs. In planning the next agricultural census in India, it is also desirable to examine the needs of various users of agricultural statistics and to adopt suitable methods.

Even if agricultural census is undertaken by complete enumeration, it will be necessary to carry out well-designed evaluation sample surveys to get some idea of errors involved in complete census. The prohibitive cost involved, huge resources in men and equipments needed, and large ascertainment errors in the results—all these

suggest that complete enumeration may not be a suitable method for data collection for agricultural census. On the other hand, a well-designed sample survey can give more reliable results quickly and at a much cheaper cost. In order to obtain estimates of reasonable precision at lower levels or for items of rare occurrence, the sample survey covering such items may be carried out in two or three consecutive years.

The suitability of some of the concepts and definitions prescribed by the FAO needs to be examined in Indian situation and in finalising these, the operational convenience and national needs should be taken into consideration.

Special surveys on some additional items, related to those proposed to be covered in the agricultural census, might be carried out along with the census, so that a more realistic picture of Indian agriculture could be obtained.

J.S. Sarma<sup>5</sup> : Agricultural Census and New Strategy for Agricultural Development.

The Government of India launched the New Strategy for Agricultural Development in 1966-67 under which concerted efforts are being made to attain self-sufficiency by 1970-71. The main planks of the New Strategy are :

- (i) Bringing, by 1970-71, an area of 32.5 million acres under the High-Yielding Varieties Programme.
- (ii) Extension of multiple-cropping over 30 million acres of irrigated area and undertaking intensive cultivation measures.
- (iii) Change in the concept of irrigation from drought-protection to intensive crop production.
- (iv) Assurance of adequate supplies of fertilizers, pesticides, etc.
- (v) Ensuring timely agricultural credit for short, medium and long-term periods.
- (vi) Introduction of improved agricultural implements to improve the efficiency of agricultural operations.
- (vii) Organisation of better extension services through demonstrations and farmers' education, etc.

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- (viii) Undertaking special area development programmes in an integrated manner, covering land levelling, preparation for intensive irrigated cultivation, better communications, markets, etc.

For planning and execution of the High Yielding Varieties programmes, it is important to know which types of farmers have adopted the programmes; whether the innovators come entirely from the bigger and medium farm groups or whether the small farmers also have taken up the programmes; whether the farmers put the entire area of their holding or only a part of it under these varieties; whether they put the entire irrigated area under the high-yielding varieties or only a part thereof. For this purpose, it is necessary to have data on the number of holdings of each size, together with statistics of area under foodgrains and total cultivated area with break-down for irrigated and unirrigated areas.

It is proposed to cover 30 million acres under the multiple cropping programme by 1970-71. The measures include replacement of the existing long-duration varieties of crops by those of short-duration. It is necessary to draw up suitable crop rotations for broad soil types within each local area, taking into account the facilities available by way of irrigation, etc. Before detailed targets are fixed for each area and programmes are drawn up, information regarding the existing pattern of cropping and intensity of cropping, classified according to different sizes of holdings, is necessary.

The intensity of use of crop land has been found to vary with the size of the holdings and their other characteristics, e.g., extent of human and cattle labour used, number and types of irrigation sources, modes of irrigation and implements used in irrigation. Different cropping intensities and cropping patterns have to be recommended for achieving the maximum returns. Holding-wise data on cropping intensities and patterns in relationship with the type of irrigation facilities available or to be developed, and human labour and cattle and mechanical power available have, therefore, to be built up.

Relationship between irrigation and size of holding needs close study. At present, in many areas, irrigation even from canals, is not perennial and protective irrigation is provided for one crop only. With the popularisation of the minor irrigation programmes, measures for intensive cultivation are receiving a fillip. It is necessary to see

what types of crops are grown at present under irrigated conditions in different sizes of holdings, whether the growth of commercial-versus-foodgrain crops bears any relationship to the size of the holding, and whether the differences in types of irrigation sources and combination thereof make any material difference in the intensity and pattern of cropping on holdings of different sizes. Unless the present practices and patterns are studied carefully in relation to farm sizes, it will be difficult to lay down detailed programmes at the field level.

There is considerable demand for fertilizers now. Further extension of distribution of fertilizers requires solution to such problems as satisfactory arrangements for marketing, credit, etc. To come to meaningful decisions regarding each of these matters, information regarding the size and characteristics of holdings on which chemical fertilizers are at present in use and the progress and problems of adoption of fertilisers on holdings of different sizes, is necessary.

For planning agricultural credit programmes, it is necessary to have information regarding the requirements of funds for different types of holdings. Although these requirements could be worked out on per acre basis taking into account total expenditure, the extent to which these funds are provided by the farmer from his own resources would depend upon the characteristics of the holding. Holdingwise information will help considerably in the implementation of credit programmes.

The demand for agricultural machinery and improved agricultural implements is growing rapidly under the impact of the new strategy. More and more farmers are purchasing pump-sets, tube-wells, tractors, power tillers, etc. It would be necessary to know which types of farmers are going in for these machines. Mechanisation is also being resorted to meet the demands for peak period labour under intensive and multiple cropping programmes. The extent to which mechanisation can supplement or replace bullock labour needs detailed study. For all these programmes, holdingwise data are necessary.

The country is covered with the national extension service under the Community Development Programme. There are ten village level workers in a Block, each worker being put in charge of ten villages. This coverage has been found to be inadequate for intensive cultivation programmes. The number and jurisdiction of extension workers to be employed depends on the manner and distribution of holdings and

their principal characteristics. An idea of the characteristics of farm population will also be useful in formulating for each local area the extension techniques suitable for that area.

It has been experienced that to obtain maximum results in agricultural development, the approach has to be an integrated development of the area, particularly in areas newly brought under irrigation. Several development measures are necessary such as land levelling, provision of field channels and drainage, conversion from dry to wet cultivation, provision of communication, opening of new markets. For proper planning of these various programmes, data on structure and characteristics of holdings at the time of undertaking the programme is essential. This would indicate the number of farmers coming into the programme, and give an idea of their resources.

In the absence of holding-wise information on the various aspects of agricultural development enumerated above, some targets are fixed at the State level and these are broken up district-wise on pro rata basis or on some *a priori* considerations. This is inadequate. Performance in Indian agriculture could vastly improve through better planning of allocation of resources and through better implementation of the programmes.

In organising the collection of data on a holding-wise basis, an important question that arises is the unit for which these data are required; for, this has a bearing on the question whether the data should be collected on a complete-enumeration basis or on a sample survey basis. A sample survey would provide holding-wise information at the State level, at the most. It can also give data at the district level, but to provide reliable data at this level in respect of holdings sub-divided into various characteristics such as size, tenure, irrigation, type of crop grown (*i.e.*, foodgrains or commercial crops), the size of the sample will have to be very large, the cost of which would be prohibitive. For most of the agricultural programmes, district and block are the planning units. The IADP is a district programme, but the unit of planning is the block. For the high-yielding varieties programme also certain districts have been selected and the programme is to be implemented in the selected blocks. Thus, the balance of advantage seems to be in favour of having the data on a complete enumeration basis. This would also provide bench-mark data which could be used in organising further sample surveys from time to time on broader aspects of holdings.

The criticism that Indian agricultural planning is imposed from the top and targets are not built up from below seems to be correct. There is an increasing realisation that, to be successful, planning has to be done from below. For doing this, one essential requisite is the availability of block-wise data.

**Saran Singh<sup>6</sup> : Agricultural Census as an Aid to Land Reforms\***

Land reform policies in the developing countries are regarded as too radical by conservatives and too conservative by the radicals. Conceived initially as an instrument of social justice for conferring the right of ownership on the cultivators and removing all vestiges of feudalism, the land reform programme has more recently acquired an economic urgency as the means for achieving greater productivity. This explains the growing emphasis laid on the removal of such motivational disincentives as come in the way of increasing agricultural production in the small farm sector. Thus, along with the objective of eliminating exploitation, a new dimension has been added to the land reform programme aimed at improving the overall economy with the small farmer as its main beneficiary.

There is, however, no gainsaying the fact that the progress in the implementation of land reform programmes has been hampered by wide gaps in the basic statistical data relating to the agrarian situation. It is in this background perhaps that the celebrated economist, Gunnar Myrdal has, in his monumental book, the Asian Drama, dwelt on the reasons why agricultural productivity in India and other Asian countries has been relatively stagnant. The trouble, in his view, is not so much the high density of population, nor even the adverse man-land ratio, but the vicious cycle in which the low living standards are responsible for low productivity, which in turn perpetuate the low standards of living.

That this cause-and-effect correlation constituting the vicious circle has lately been broken is doubtless due to multiplicity of favourable factors. First and foremost, a slow but sure change in the land structure, including consolidation of holdings, coupled with systematic activation of the infra-structure, especially in the areas

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\* The views put forward in this paper are an expression of the author's personal opinion and are not necessarily those of the Department of Agriculture, Government of India.

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covered by IADP, and introduction of high-yielding varieties of seeds have, in a setting of generally favourable weather conditions, ushered in a break-through. Naturally, the immediate task of identifying potentially productive areas and the institutional arrangements for the supply of inputs must claim first attention of the administrative and extension staff. The scientist and the statistician have to keep abreast with the problems arising from this programme.

The success of the new strategy will depend upon a re-examination of the institutional set-up, combined with a systematic and continuous collection and study of the mass of data on agricultural holdings and their physical characteristics. A stage has been reached where it is necessary to examine the structural arrangements of land, focussing attention not only on the size of the holdings but also on the way land is used. To accomplish this, it is necessary that data on land holdings are collected systematically by means of the forthcoming agricultural census.

The principal item of interest from the point of view of land reform programme would seem to relate to the data on the size and distribution of ownership and the operational holdings, tenurial relations, farming practices, etc. Census data on operational holdings would show the extent of owner-cultivation by providing :

- (i) the percentage of area owned to the total area under cultivation ;
- (ii) the area leased as percentage of the area owned; and
- (iii) the area under personal cultivation of owners. This information, important in itself, will serve as a useful guide for strengthening the infra-structure and improving the arrangements for institutional credit. Formulation of a more acceptable policy in regard to maximum, minimum or optimum size of a holding would depend on collection and analysis of such data. It is not unlikely that in the interest of growth of rural economy, land reform measures in general and the ceiling laws in particular may require certain re-adjustments so as to promote the process of sustained growth through more efficient techniques of land and water management.

Consolidation of holdings is another programme wherein agricultural census data can play the pivotal role. It is no mere

coincidence that the production gains have been most significant in areas where consolidation of holdings has been systematically carried out. Further, sample studies could show that it may not be enough to stop at rectangulation and bringing together of bits and pieces of individual holdings. A land utilization plan for the village as a whole which would not only include land and water management, but also suggest the most suitable crop rotation can be possible by means of complete data on land and soil characteristics.

**Tenancy Reform :** The pace of tenancy reform has been retarded by a number of factors including the paucity of data regarding the rents actually paid by the tenants as distinguished from those payable under the tenancy laws and an almost total lack of information about the additions to cultivator's assets and his overall credit-worthiness. An important end-use of census data would be a secure fixation of fair rent and offering guidelines for commutation of produce rent into cash rent. Under the present level of share-cropping the landlord considers it unnecessary to invest in land and the share cropper has not the means to invest in inputs. From this premise, the need for a drastic revision of the loaning procedures of credit institutions becomes self-evident.

**Land Records:** One of the most serious impediments to land reforms is the lack of the basic record of tenancies, in many areas. It is recognised that preparation of such a record is crucial alike to the implementation of the land reform programme and the success of intensive agricultural programme. Up-dating of land records cannot brook any delay. The revenue machinery will have to be adapted to the new requirements.

F.C.V. WICKRAMARATNE :?

Experiences of Census Taking in a Developing Country : Ceylon.

A census involves a chain of operations and, as is well known, a chain is just as strong as its weaker links. Its strength is derived from the efficiency of an administrator and the skill of the statistician: the weakness is forged by the fears and doubts, arising in the minds of the farmer, when census technicalities seep into him, through the misunderstandings and errors of the enumerator. All the meticulous programming and statistical designing can be negated and census-taking reduced to nought, unless the census-taker views concepts and

definitions carefully against the background of practices prevalent in the country and, along with precautionary instructions, takes to other safeguards, both on the field and off.

In Ceylon, the task of enumerating all land used for agricultural production was made more difficult in the absence of a list of holders' holdings. The several government departments dealing with agriculture and allied subjects, had each certain information but the several lists of the lands, rubber lands, lands given under village expansion schemes and colonisation schemes were unco-ordinated. In any case, all these lists together would not have covered the entirety of land used for agriculture. The situation in regard to cadastral maps was no better, for neither did they cover the whole country nor had they been kept up-to-date.

Hence the first essential was the preparation of an enumeration frame. This frame was one of households, prepared village-wise, in which particulars of land areas and numbers of livestock maintained by holders, resident in each household, were shown in some detail. Among the problems connected with the preparation of the enumeration frame were :—

- (a) Double counting of holders owing to difficulties of identifying the actual holder from between 'absentee proprietors' and 'hired persons in-charge', between 'owners of land' and 'those to whom all land of a particular owner was rented', and between one joint-owner and another, and owing to difficulties of identifying the permanent residence of migrant operators.
- (b) Omission of persons who held land and livestock but were unwilling to disclose this information owing to fear of taxation, etc.
- (c) Inclusion of persons who adopted the subterfuge of claiming some land, in the neighbourhood, in the mistaken belief that an entry in a census document could be cited later in support.

To combat these situations, a publicity drive was launched, in time, to cover the phase of listing of households, which commenced about nine months before the date set for the census enumeration. Posters and radio talks clarified the aims and objectives of the census and stressed the confidential nature of the census documents.

Listing of households was generally entrusted to the village headman. The limits of his division were defined well enough and made known to him, to prevent over-lapping. The concept of the operational agricultural holding was foreign to his way of thinking and had to be drilled into him, by means of instruction leaflets and special instruction classes. This, and a lurking fear that he would doctor his lists to correspond with information already in his possession, made it essential for intensive on-the-spot field checks especially at the early stages of listing. Correction of errors and further clarifications of instructions were then made. On the whole, the village headmen maintained high standards of work, so much so, that the only instance of double counting of migrant operators was detected in regions where the services of other officers were used, in preference to those of the village headmen. The problems posed by absentee proprietors necessitated special precautions. Where a hired employee was found, the name and address of the absentee landlord was collected on the listing form, along with other particulars. Checks made subsequently to detect duplication, between proprietors and persons-in-charge, were thereby facilitated.

Even though the holder was identified, his holding was not always easily determined, for it generally consisted of more than one parcel; the holding did not necessarily remain static throughout the year, for changes in tenancy at the end of a season in respect of one or more parcels would contribute towards expansion or shrinking of a holding; in the case of holders who practised shifting cultivation, some had abandoned such parcels of land at the time of census; one holder may have had more than one holding; and certain holders of livestock poultry may have held no land at all.

There were other complications too, such as :

(i) *Joint holders*—in which cases the holding was regarded as a fractional holding and the enumerator returned the figures of the entire holding, adjustments being made later during the tabulation phase; and

(ii) *One agricultural holding within another*—in the large holdings of the estate sector, the employees residing within the estates may have cultivated garden crops and or tended a few head of livestock within the estate. It was found impractical to treat them as separate holdings so that such land/livestock was included as part of the main holding (estate).



A pilot census was conducted as a dress rehearsal of almost the entire census undertaking, from the listing of households to the final tabulation and analysis of data. It was taken in three fairly extensive but separate regions, selected with a view to cover as wide a cross section as permissible of the varying situations likely to be encountered throughout the country. While the sample design was found to be adequate, the pilot census pointed to misunderstandings and doubts in the several phases of the listing of households, selecting the sample, enumerating the holdings, editing the schedules with adequate checks to secure internal consistency, punching of cards and their sorting and tabulation. Clarification of these instructions and procedures resulted in unravelling situations which, later on, in the main census operation may have proved baffling.

Changes in the questionnaire, used at the pilot census, were effected in a bid to save time spent on enumeration, and to obtain additional data.

#### **Field Organisation and Procedures :**

*Census Personnel.* The use of mailed questionnaire at the enumeration stage was restricted to holdings of 50 acres and over in extent. Such a direct approach as this would not have answered in the case of the multitude of small holders. Thus, it was necessary to set up a field organisation, of considerable proportions, beyond the normal resources of the Department of Census. The field staff of the Department of Census manned key points to ensure coordination, proper timing and effective dissemination of instructions, etc. Higher officials of the central office, were assigned geographical areas for inspecting and clarifying doubtful points on the spot.

Field checks were instituted at the various stages of operations. Further checks on field work were instituted in the immediate post-enumeration phase. A copy of one completed schedule, selected at random from every one of the enumerators was mailed to the central office, where the entries were scrutinised by trained personnel and directions given for correction of errors, where detected. In the small holding sector, every one of the households, selected for enumeration, was checked against the field-in schedules. In the estate sector, where complete enumeration was planned, check against card indexes of all estates, which had been compiled for the purpose, revealed both duplications and omissions. Cases of omission were referred back to the concerned enumerators for re-service of sche-

dules. By these means, the number of estates which remained unenumerated fell from over 1,100 to about 300.

### Land and Crop Areas :

Physical areas of land/crops reported at the census, were necessarily approximate and were generally recorded by inquiry from holders without further checks. Even where cadastral maps were available in some regions, sub-divisions of parcels of land and other changes, over the year, would have rendered them unusable. Permanent crops encountered in the course of enumeration especially tea and rubber may have provided an element of accuracy, in estimation of area, for these crops were subject to registration and assessment by controlling authorities. Further tea and rubber were generally in the possession of a class of land-owners who would have relied on land surveys, in acquiring or disposing of such lands, so that their areas would be known accurately.

In some of the minute coconut plots the delineation of the limits of a person's holding was not possible, even on the ground, for palms in the same garden were apportioned between two or more holders. For lands reserved for the specific purpose of cultivating paddy, areas were known, in the past, in terms of the volume of grain sown, the unit of measurement varying from region to region. Over the years, some degree of standardisation of these local units in terms of acres, roods and perches had been attempted and has now been attained, though an element of doubt still exists as to the areas occupied by ridges, bunds, threshing floors, etc., within the tracts of paddy land.

The view held generally that consistent under-reporting of areas is widely practised is open to doubt, for it presupposes that the farmer is aware of the accurate area and consciously under-rates it. Though there would have been differences, severe at times, between the actual areas, as they existed, and those recorded on the census questionnaires it seems more correct to infer that these differences were due largely to inaccuracies in assessing these areas. These differences may also have cancelled themselves, in the long run. Wide scale under-reporting should have resulted in figures which fell short of those from more reliable sources. Comparable but independent sources are not easily available for figures of an earlier census would have differed in point of time, and also, have been subject to similar disabilities as those mentioned above. The air surveys conducted over the entire country made available data on

land and crop areas from two independent sources not widely separated in point of time. While the figures of temporary crops which can expand or contract, from year to year, do not lend themselves to comparison, areas of land under permanent crops or under a permanent form of utilisation, as is paddy land in Ceylon, should be comparable. For a crop such as rubber the results showed an unbelievably close correspondence, for crops as tea and paddy the differences are easily reconcilable while for others such as coconut and cocoa, wide disparities appear, at first sight, to render the figures from one or other of these two sources, unusable, strange though it may seem, under the surface of the conflicting definitions concepts and circumstances of the two surveys, even these figures could be harmonised but in determining the area, for each of the crops concerned, the census estimates would certainly take precedence over those of the air photographs.

Dejo Savananda<sup>8</sup> : Experience of Census Taking in Thailand.

The first agricultural census in Thailand was conducted in 1937, the second one was taken in 1950-51. In 1963, Thailand participated in the World Programme of the Census of Agriculture on a complete enumeration basis for the whole country.

The main objective of the 1963 agricultural census was to obtain basic statistical data needed in formulating plans for development of the agricultural economy of the country. This census revealed the main agricultural facts for the whole kingdom and for each province.

The Census Division, now known as the Economic Survey Division, was responsible for the conduct of the agricultural census. The census also benefited from the expert advice of the Group of USOM Statistical Advisers.

#### **Preparatory work for the Census :**

All the requests from the potential users in different departments and Ministries were taken into consideration in preparing the questionnaires. A definite effort was made to balance the requests within the time and the budget allowed for the Census.

Pre-tests were undertaken in six selected provinces throughout the country. After these pre-tests a full scale pilot census including

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8. Deputy Secretary General, National Statistical Office, Thailand.

data processing was made in order to ensure the success of the 1963 census of Agriculture.

The country was divided into regions, provinces, districts, tambons (a group of villages) and villages for administrative purpose. Then tambons were divided into enumeration districts by geographical areas. Each enumeration district contains, more or less, the same number of households. Maps showing the boundaries of districts and tambons were made and got checked by the local officials. One enumerator was in charge of one enumeration district.

In order to establish a frame of the Census of Agriculture, all households in the enumeration districts, except certain districts in Bangkok and Thonburi for which results of 1960 Population Census showed the number of agricultural households to be less than 5 per cent of total households, were first listed by the enumerator. Then only the agricultural households were interviewed by the enumerators.

The training of supervisors and enumerators was done on three levels viz., Provincial officers, District supervisors and enumerators.

There were a total of 15,176 enumerators, most of whom were teachers and local officials. The enumerators worked under the supervisions of 3,100 team leaders.

#### **Enumeration :**

The census enumeration was carried out by the interview method. The interviewing was carried out for every farm operator, i.e. if within a house, there were two farm operators, they were both interviewed. The enumeration took place during a period about 25 days, starting on 16, April, 1963. A total of 3,214,405 holders were enumerated.

#### **Evaluation of Results :**

In order to test the adequacy of the census of Agriculture in term of coverage, accuracy of response and transcription of errors, the census programme included a post enumeration survey which was conducted by a group of highly trained enumerators.

The PES questionnaires did not cover all topics included in the Census questionnaires but required more detailed information on selected items. These PES questionnaires were obtained for a sample of holdings selected with overall sampling fraction of 1 in 1000.

The PES questionnaires were matched against Census questionnaires on the basis of name of operator, location, and other characteristic of the holding. In some cases, a PES field investigation was conducted to resolve doubtful cases and to obtain additional information needed to evaluate the result.

### Experiences :

The budget we were allowed for the census was only about 60 per cent of what we had proposed. As a result we had to optimize our resources. In spite of this we were able to get data of both the quality and quantity which was required.

Personnel problems, in particular concerning enumerators presented some difficulties. In the 1963 Census of Agriculture, school teachers were employed as interviewers. They were free only during the 30 days vacation, and the problem of training them to be qualified interviewers were really critical.

We faced the same problems for supervisors who were district's officers and principal of schools. Coordination was also another problem. Personnel of many different agencies such as the Ministry of Agriculture, the Ministry of Interior, provincial government, district government as well as various other national Ministries were used in taking the Census. We needed to have very good coordination among those agencies in order to get the work done.

We used methods designed for more developed countries in area where there is often a lack of reliable maps and communications problems in rural areas presented difficulties. In order to avoid the undercounting of agricultural holdings and under-estimation of total production by a figure which is at least 5 per cent it will be necessary to make adaptations to the techniques.

Data for the whole kingdom, the major regions and the provinces are relatively reliable for major crops. Data for such areas, however, are likely to have serious biases. Since much planning is on a small area basis, the demand on the data is greater than its reliability can bear. It is not sound to use small area data.

As our questionnaires were very detailed, we found that sometimes it was very difficult indeed to get reliable data. In the future we shall need to employ qualified interviewers on a larger scale and improve questionnaire design to improve the reliability of the data collected.

A publicity programme is a very useful tool in taking any censuses. To be effective it requires the efforts and skills of professional hands, and we must put more efforts into this aspect.

In processing the data, inconsistent questionaired entries for area and production were edited by electronic computer. When this was necessary, the production imputed to the area was the average for the crop within the enumeration district. Editing procedures of this type were felt to produce superior data to that which would result from tabulation of inconsistent entries.

Apart from the above deficiencies, the 1963 Census of Agriculture was quite a successful one. Experience had shown that the success of any censuses does not depend solely on questionaired design, field work operations etc., it does depend on planning a good data processing system, too. The most important of all is to have census data published within a reasonable time, otherwise the publication of statistics is too long delayed to be of value. In our case, about 18 months after the enumeration, the Census data for each province and the whole kingdom were published.

#### **Discussion and Concluding Remarks by the Chairman :**

In the discussion that followed, Mr. Pradhan from Nepal listed the numerous difficulties faced by the developing countries in census-taking, arising from lack of education, want of upto date and reliable village records and fear of taxation on agriculture. The need for a regular and continuous programme of training the enumerators and educating the people on the usefulness of census-taking and on the harmless and confidential nature of the information obtained in respect of an individual holder, was stressed. Shri D.S. Ranga Rao, Regional Statistical Adviser, F.A.O., Bangkok provided detailed information on the census arrangements in the countries of the south-east Asian region

Summing up, the Chairman observed that the discussion had covered a wide ground from a theoretical appraisal of concepts definitions and methodology to practical problems involved in census-taking. He was grateful to the distinguished participants for making their respective contribution, and more particularly to the foreign visitors. He stressed that the opportunity of the ensuing World Census should be availed of by India to collect the information required for improving the basis for better agricultural planning in the country. He referred to the main observations of the distinguished

speakers on the usefulness of census data, and pointed out that along with programme for supply of modern inputs, price policy constituted an important plank for agricultural transformation in the developing countries. It governed the reallocation of available resources as between different crops and regions and determined the volume of investment that the former could make. The magnitude of the surplus of sale proceeds left with the farmer after meeting his cost of cultivation and expenses of living was thus crucial for setting the pace of agricultural development. Cost of production could not be assumed to be uniform for widely varying groups of holdings; nor was it alike for the irrigated and unirrigated holdings. Credit needs of the farmers varied with size of holdings, apart from the cropping pattern adopted. This was not all. Farm income depended on the marketable surplus, which in turn was closely related to size of holding. In a regime where the State pre-empted a certain portion of the produce of the farmer for public distribution, justice demanded that the burden of such levy was distributed equitably. This could be done with a measure of confidence if information on grain-wise production was available by size of holdings, irrigated as well as dry. In the absence of such detailed information for all crops and regions, it was difficult to say if a differential price policy would optimise the total agricultural production sooner than a general one. Prices and the volume of marketable surplus also had a bearing on income distribution in the rural sector. Many were thus the facets of price policy on which agricultural census data could throw light. The chairman concluded that not for a scientific price policy alone, but also for realistic planning and for proper land reforms, it would be wise to stretch the base of the coming census wider than has been the case with the previous censuses in India.