

AGRICULTURAL STATISTICS AND NATIONAL INCOME ESTIMATES

By

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Introduction

Mr. President, Secretary and other office bearers, Members of the Indian Society of Agricultural Statistics, Distinguished Participants, Ladies and Gentlemen;

I deem it a great honour and privilege to be invited to deliver this address before a gathering of so many eminent agricultural statisticians.

Let me first of all congratulate the Indian Society of Agricultural Statistics for providing an excellent forum for discussing certain topics of current interest at its annual meetings with the long-term objective of improving the quality of agricultural statistics in the country.

In my address, I wish to present a factual review of available agricultural statistics used in the preparation of national accounts, their limitations and areas of possible improvement.

Historical Aspects

Some of you might be aware that in 1960, the Indian Society of Agricultural Statistics arranged a symposium on 'Problems of Estimation of National Income from Agriculture' and discussed a number of problems—both theoretical and practical—that arise in deriving the sectoral estimates of national income with special reference to agriculture. Inadequacy of the data base in deriving sectoral estimates of national income was also discussed in a fairly great detail about eight years back, in 1972, when the Indian Econometric Society started a series of seminars on the Data Base of Indian Economy. Five areas selected for discussion at the first seminar included both agriculture and national income; other subjects were likewise discussed in the subsequent seminars. In my address I have tried to bring out the

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latest position in regard to data availability in the agricultural and allied sectors based on the experience of the Central Statistical Organisation (CSO) in the preparation of our national income estimates.

Concept of National Income and Methods of Estimation

As all of you are aware, national income is a measure of the totality of all goods and services that the economy produces for the consumption of its nationals or for the expansion of their existing productive assets to be used for further production. As the different units of production and the different measures of services are not directly additive because of differences in units of measurements, the measure has to be expressed in value terms. To get the correct measure it is to be ensured that the total value of products is counted without duplication, *i.e.*, the value added at each stage of further processing is only taken into account while measuring the total.

The national income of a country can be measured in its three phases of production, income generation and final utilisation. These three phases are circular in nature. It begins at the production stage where the productive units engage capital and labour and turn out goods and services, the total measure of which gives the national product of the country. This production process yields some money income which is distributed by the productive units to the two factors of production, *viz.*, labour and capital. The totality of this distribution gives a measure of national income or distributive shares of national product or national income by factor shares. This money income received by the two factors of production is either spent by the labour in purchase of goods and services by households or in acquiring more capital and increasing physical assets of the productive units both by households and the producers. Thus the national income can be measured by following any one of three alternative approaches, *viz.*, production approach, income approach and expenditure approach. The national income by definition is equivalent under each of the three alternative approaches. For a complete analysis of the economy it is desirable to measure national income by all the three approaches simultaneously. However, in most of the developing countries, adequate data are not available to derive national income estimates through all the approaches separately.

In India a combination of the three approaches is used for different sectors of the economy in arriving at the most plausible estimate of national income. For the primary sector, *viz.*, agriculture, livestock, forestry and fishing (excluding irrigation), the production approach is used. This involves estimation of gross value of products and by-products and ancillary activities and deduction of value of inputs of raw materials, services and consumption of fixed capital in the process of production to obtain the net value added. The prices to be used for evaluating production are the prices received by the producers or prices paid at the first point of transaction. Only for irrigation, income approach is used. The gross value added from the operation of Government irrigation system is obtained as the sum of compensation of employees, interest payments, operating surplus and maintenance provisions, the details of which are available from the Central and State Government budgets. The estimates of gross value added are then netted for consumption of fixed capital to obtain the corresponding net value added.

National income is generally measured at prices prevailing during the year or in other words at current prices. When calculated over a number of years the changes in national income would, therefore, include implicitly not only the effect of the changes in the quantum of production over the period but also changes on account of fall or rise in prices. For a proper measurement of the economic welfare of the people or growth of the economy it would be necessary to eliminate the effect of change in prices by working out national income/product/expenditure at constant prices. The system of national income estimates would, therefore, include measures both at current and constant prices.

Summing Up

Whether measuring at current or constant prices, the product or the income method can be applied for measuring the sectoral contributions to national income. However, the expenditure method has to be followed independently to determine the final utilization of outputs, *i.e.*, to estimate capital formation in each industrial sector and the total current consumption of households and non-profit making bodies. For the Indian system of national income, the sectoral contributions to national product particularly

for the commodity producing sectors are obtained by the value added method, the factor share components by the income method, and the capital formation by the expenditure method. The estimates for the agricultural sector which account for a very large proportion of the total national product, the estimates are prepared by the three approaches though one of the components of factor income (*i.e.*, income of the self-employed persons) is obtained as a residual. The estimation in each case requires not only identification of all the products and by-products of the sectors concerned, the prices and the inputs but the number of persons engaged, their incomes, other factor payments like interest, rent, etc., and the capital expenditures. These requirements of data can be broadly classified into :

- (a) Figures of production of each agricultural commodity in quantitative terms and the corresponding by-products, if any,
- (b) Producers' prices in respect of each such commodity,
- (c) Quantity and price of each input of raw materials and services used in production,
- (d) Consumption of fixed capital in the process of production,
- (e) Number of persons engaged as paid labour or as self-employed persons,
- (f) Wage rates and income per person,
- (g) Transactions in other factor incomes, and finally
- (h) Capital expenditure under different categories.

Importance of Agriculture

The table depicts the percentage distribution of net domestic product at factor cost by industry of origin at current prices. The table reveals the predominant position occupied by the agriculture and allied sectors towards contribution to the national product. Although the contribution of this sector has shown in recent years a declining trend, it still accounts for more than 40 per cent of net domestic product. Precision of the estimate in this sector, therefore, vitally affects the overall accuracy of the national estimate.

TABLE

Net domestic product at factor cost by industry of origin
(at current prices)

| Industry | Percentage distribution | | | | |
|--|-------------------------|----------|----------|----------|-----------|
| | 1974-75* | 1975-76* | 1976-77* | 1977-78* | 1978-79** |
| Agriculture, forestry and fishing | 47.7 | 43.8 | 41.9 | 42.5 | 41.0 |
| Manufacturing | 15.1 | 15.2 | 15.7 | 15.6 | 16.2 |
| Mining & quarrying | 1.1 | 1.3 | 1.3 | 1.2 | 1.2 |
| Transport, communications and trade | 16.9 | 17.9 | 18.1 | 18.0 | 17.9 |
| Banking, insurance & real estate ownership | 4.6 | 5.3 | 5.7 | 5.9 | 6.2 |
| Public administrative defence | 4.8 | 5.2 | 5.1 | 4.9 | 5.2 |
| Others (e. g., construction, electricity, other services etc.) | 9.3 | 11.3 | 12.2 | 11.9 | 12.3 |
| | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

* provisional ** quick estimates

Source: *National Accounts Statistics*, 1980, CSO, New Delhi.

Thus, the availability of comprehensive and reliable data pertaining to agricultural sector is of prime importance for the computation of national income of the Indian economy.

Adequacy of Data

Let me now elaborate the present status of available agricultural statistics and comment on their adequacy in yielding reliable estimates for computation of national income. For the purpose of my review I would consider agriculture and allied sector to be comprised of the following sub-sectors: agriculture; livestock; forestry; and fishing.

In the Appendix, I have tried to explain in some detail the current procedure adopted by the CSO for estimating the value of different kinds of output and of various inputs used in the production process. I wish to highlight some of the important points that emerge from the detailed analysis.

Principal Crops

At present the production estimates of majority of principal crops are based upon scientifically conducted crop cutting experiments developed and extended during the last three decades (or so). The area covered under the crop cutting experiments is more than 90 per cent for 12 principal crops but for a few crops the coverage is as low as 34 per cent (dry chillies). There are also a number of crops such as ginger, turmeric, garlic, arecanut, banana, whose production estimates are not based on crop cutting experiments. Regarding the producers' prices in respect of the principal crops the requisite data are directly collected for all crops except for small millets and other pulses in whose cases the prices are estimated on the basis of price relationships observed between the prices of related crops during the years 1951-53,

Minor Crops

The output data in respect of coffee, opium, cashewnut and rubber are satisfactory but in case of tea which is a very important crop, no direct estimates of production and value are available. The estimate of raw tea leaf is derived by making use of the relationship between raw tea leaf and the processed tea obtained from the detailed results of Annual Survey of Industries and the processed tea statistics brought out by the Tea Board.

No direct estimates of production are available for individual fruits & vegetables in general. The production estimates of mango, citrus fruits, and grapes are obtained on the basis of the yield rates from the relevant reports issued by the Directorate of Marketing & Inspection in 1965 and the area estimates issued by the Directorate of Economics & Statistics, with a time-lag of 3 years. No separate estimates of area or production are being brought out for other important fruits. Similar is the case in respect of important vegetables,

Unspecified and Miscellaneous Crops

No direct estimates of production are available for the unspecified and miscellaneous crops. These are estimated indirectly by using the area under each of these crop groups and the average value of yield per hectare derived from the results of the surveys conducted by National Sample Survey Organisation (NSSO) during the years 1951-53 and 1956-57.

Products and By-products

The by-products arising from cultivation of crops and their processing by indigenous methods are included in the value of total agricultural outputs only if they are readily identifiable and have some definite economic value. These cover stalk and straw produced from different categories of foodgrains, pulses like arhar and sesamum, cotton, jute and sugarcane besides farm yard wood collected by the primary producers from trees outside regular forests. The data on yield rates of stalks or straw per unit tonne production of the concerned crops are obtained from surveys conducted from time to time. These ratios are often collected during crop estimation surveys. However, such data are not collected on a regular basis and the same yield rates are, therefore, generally utilised for a number of years.

Livestock

The estimates of gross value of output of livestock products are based on the number of different categories of animals obtained by interpolation from the results of the quinquennial Indian Livestock Census and average yield rates obtained from studies conducted by State Animal Husbandry Departments, NSSO, Indian Agricultural Statistics Research Institute (IASRI), the Directorate of Marketing and Inspection etc. The State-wise estimates of number of different categories of animals obtained by means of interpolation/extrapolation are not realistic for the intercensal or postcensal years in case of those States which witness severe drought in different periods. In such situations as well as for more realistic measures of annual change in livestock population, it might be desirable to plan for small size sample surveys at regular intervals.

The yield rates of meat for different categories of animals and the proportions of slaughtered to their population are based upon the data supplied by the Directorate of Marketing and Inspection

which relate to 1967-68. In respect of by-products the basic data are derived from the relevant Marketing Report of 1961 only (DMI-1961). Estimates of fallen animals, goat hair, pig bristles are also based upon relevant Marketing Reports (DMI-1961). However, it is heartening to note that under the Ministry of Agriculture Scheme of Integrated Sample Survey for estimation of animal products, information on yield rates is being collected on annual basis by some of the States in consultation with IASRI in respect of milk, wool, egg and meat.

Major Forest Products

The data on major forest products are available from the Chief Conservator of Forests, and adjustments are made for under-reporting and illegal removals, which are based on some study carried out by the Forest Wing of the Ministry of Agriculture in 1958. The prices of major forest products relate to the prices prevailing in the assembling markets. Some adjustments worked out on the basis of the study carried out in 1958 are made to arrive at the producers' prices.

Minor Forest Products

No direct estimates of minor forest products are available and the economic value of output are derived from the royalty value/contract fee realised.

Fishing

The estimates of production of marine fish are based on the surveys conduct by the Central Marine Fisheries Research Institute and the prices data are provided by the State Statistical Bureaus. But in case of inland fish which accounts for about 55 per cent of the total production, the estimates of production are based on the market arrivals or consumption data. This is one area where a satisfactory methodology of estimation of output is yet to be evolved. No direct estimates of subsistence fish are available and they are derived as some percentage of inland fish.

Inputs

In our country, agricultural and livestock production generally go together. Very little data as such are available which would make it possible to separate out clearly various inputs like livestock feed, repairs and maintenance cost, consumption of fixed

capital into those used for agricultural products and livestock production. The figures of value added are, therefore, being estimated combined for the agriculture and livestock sub-sectors. Estimates of *livestock feed* which consist of grains, gram, oil cakes etc., are at present prepared on the basis of studies carried out in the year 1947-48 (Baljit Singh, 1947) and (D.R. Gadgil, 1948) and NSS surveys in 1955-56.

Another important agricultural input is the *chemical fertilizers*. At the national level, estimates of consumption of chemical fertilizers are being prepared on the basis of distribution of chemical fertilizer and not on the basis of actual consumption data which are not available.

The estimates of *expenditure on repairs and maintenance* are based upon data on All-India Debt and Investment Survey (AIDS 1971-72) of Reserve Bank of India. The estimates for the successive years are obtained by applying the proportion of expenditure on repairs and maintenance to the value of capital stock obtained from this report under the assumption that the proportions have not changed.

No data on input and consumption of fixed capital are available for the forestry sector. At present an overall deduction of 5 per cent of gross value is being made—4 per cent for operational cost and repairs and maintenance and 1 per cent for the consumption of fixed capital.

No estimates of expenditure on operational costs, repairs and maintenance and consumption of fixed costs in fishing sector are available. At present an overall deduction of 20 per cent for marine fish and 10 per cent for inland fish of gross value is made.

Factor Incomes

Estimates of factor incomes are prepared separately for the organised and the unorganised institutions. The basic data used for agriculture in preparation of estimates of: (a) compensation of employees, and (b) rent are the results of farm management and cost of cultivation studies of the Ministry of Agriculture. The farm management and cost of cultivation studies conducted by 16 States cover a large number of crops from 1961 to 62 onwards,

For livestock sector, the estimates of these components of factor incomes are prepared on the basis of data available from the NSS Report No. 65 (11th round of NSS—1956-57) and the Indian Livestock Censuses. Regarding estimates of interest, data base is the AIDIS-1971-72 of the Reserve Bank of India. Information on outstanding amounts of loans are independently provided by the Primary Agricultural Credit Societies and Primary Land Development Banks. The estimates of compensation of employees, rent and interest as calculated above are deducted from the total net value added from the agriculture (including livestock) sector to obtain the residual 'mixed income of self-employed'. Being household in nature the mixed income of self-employed in the sector forms nearly 60 per cent of the net value added. For the organised part of the sector which consists of plantations, Government irrigation system etc., the data base is the RBI analysis of Balance Sheets of Sample Companies and Government Budgets. The estimates for the organised sector may be considered to be fairly reliable. But for the unorganised sector which forms an overwhelming part of the agriculture and livestock sector, the estimates have their limitations as the economic activities are generally undertaken by the household members and in this case it is difficult to disaggregate the estimates for different components of factor incomes. An agricultural household in the rural areas often combines so many types of activities within itself that it is well nigh impossible to separate out the payments or the receipts that it gives or gets on account of one or the other. In such situations there is no other alternative but to obtain the estimates by the use of all possible data available directly or indirectly where there is much scope for improvement. Besides, very limited annual data on a regular basis are available even from farm management and cost of cultivation studies.

Capital Formation

The estimates of capital formation in agriculture and allied activities are prepared separately for fixed assets and change in stocks and also for public and private sectors. Data of expenditure on capital formation are called out from the budgets of the Central and State Governments, local bodies and the annual accounts of public sector agricultural undertakings. For private sector no such annual data on capital expenditure are readily

available and the estimates are generally based on the results of bench-mark surveys and annual indicators of likely levels of capital expenditure.

The estimates of expenditure on fixed capital formation on household sector excluding livestock for 1971-72 were prepared on the basis of data on expenditure in farm business available from All-India Debt and Investment Survey (AIDIS), 1971-72. The estimates for later years are being obtained by moving the bench-mark estimates for 1971-72 with the help of suitable quantum and price indicators. The data used for rural household are thus very old, *i. e.*, of a survey conducted 10 years back and similar data are not yet available for urban household. Results of 17th round (1961-62) of NSS are currently being used for building up the estimates of capital formation (urban).

The estimates of *capital formation* in respect of *livestock* are prepared by evaluating the addition to livestock at average wholesale prices. These suffer from the limitations of no current data on change in population.

The estimates in respect of *changes in stocks of agricultural commodities* with the producers are worked out on the basis of data on bank advances according to purpose published annually by the Reserve Bank of India. The estimates prepared on the basis of bank advances are not very sound, and need to be replaced by direct data on the subject.

Major Data Gaps

To sum up, the limitations of the present agricultural statistics in the estimation of the national income from this sector are as follows :

- (i) There is no scientific basis for the estimation of crop production for some of the principal crops, vegetables and fruits.
- (ii) The norms used for the indirect estimation of crop production are often based on outdated data.
- (iii) Yield rates used for the estimation of output of meat and meat products are quite old.
- (iv) Utilisation rates, conversion ratios used for deriving the contribution of livestock products are generally not based on any scientific studies.

- (v) Data pertaining to operational cost of livestock products are lacking.
- (vi) Reliable data on repairs and maintenance are seldom available.
- (vii) Data on consumption of fixed capital are quite meagre.
- (viii) Price data for some of the agricultural products are not available.
- (ix) Information on annual shifts in different components of factor incomes are far from satisfactory.
- (x) Annual data on fixed capital formation and inventory holding in the private agricultural and livestock activities are not available.

STEPS TAKEN TO IMPROVE QUALITY AND TIMELINESS OF AGRICULTURAL STATISTICS

From the foregoing discussions one should not conclude that no serious effort is being made for improving the quality and timeliness of statistics of agricultural production. In fact, the Seventies may perhaps be considered as a decade in which concerted efforts were made to improve the timeliness and reliability of the agricultural statistical system. In the earlier decades since Independence, the ascent was mainly on increasing the scope and coverage of the system, adoption of uniform concepts, definitions and procedures, and in the evolution of suitable methodologies for surveys on different aspects of agriculture. As a result, the percentage of area for which land use and crop area statistics were available on the basis of complete enumeration increased from 47 in 1948-49 to 82 by complete enumeration or sample surveys in 1969-70. Similarly, while in the early Fifties, production estimates for almost all the principal crops were based on the method of eye estimation, over 1,50,000 crop-cutting experiments were being planned in the different States in 1969-70 under the Crop Estimation Surveys (CES) to estimate objectively the yield rates of principal food and non-food crops employing the technique of random sampling. These efforts were continued in the Seventies also, as would be seen from the fact that at present area statistics for 87.5 per cent of the geographical area is covered by complete enumeration and sample surveys and over

2,30,000 crop-cutting experiments are being planned annually. About 95 per cent of the production of cereals and 73 per cent of the production of pulses and between 75 per cent and 99 per cent of the production of important commercial crops are based on Crop Estimation Surveys.

With the strengthening of the foundation of the agricultural statistical system, the need for paying attention to the aspects of timeliness and reliability of the system was felt. The need arose from the practical difficulties experienced in the implementation of the improved techniques and procedures at the field level. In regard to area statistics, while the system based on land records is suited to many States in the country, it was found, in practice, that due to a number of reasons, the patwari was unable to devote adequate time and attention needed for collection of agricultural statistics. This affected their quality. The multifarious duties assigned to the patwari also affected his normal schedule of work and resulted in delay in the submission of crop statistics.

Timely Reporting and Crop Improvement Schemes

For the purpose of improving the timeliness and quality of data, two schemes, *viz.*, the Timely Reporting Scheme (TRS) and the Scheme for improvement of Crop Statistics (ICS) are under implementation. The TRS initiated in 1969-70 provides for obtaining area estimates on the basis of priority enumeration in a sample of 20 per cent of the villages selected at random. It provides for intensive supervision both by departmental and by statistical staff of the State for ensuring timeliness and accuracy. There is also a provision for estimates of area under irrigated and unirrigated categories of important crops as also under high yielding and traditional varieties. Efforts are under way to explore the possibility of building-up land use statistics on the basis of priority enumeration in the selected sample of villages.

The ICS attempts to improve the reliability of area and yield estimates. The scheme provides for supervision of area enumeration by whole time statistical staff in a sample of 10,000 villages which are shared equally by the NSSO and the States. The supervision is intended to bring out the inaccuracies in the crop enumeration work done by the patwari in the form of : (a) missing of the crop actually sown in the field, (b) reporting of a crop

when it is not grown in the field, (c) incorrect assessment of area under crop sown in the fields, and (d) totalling errors. The surveys undertaken under the scheme are essentially in the nature of quality checks intended to study the non-sampling errors in area enumeration and covering such errors as observational errors, aggregation errors, errors due to non-response, etc. The ICS Scheme also provides for supervision of about 30,000 crop-cutting experiments shared equally by the NSSO and the State Governments. The objective behind the supervision is to study non-response and the departures from prescribed procedures for conducting crop-cutting experiments, especially those relating to marking of experimental plots, harvesting the crops in the plot and the weighment of the produce.

The experience of implementing the TRS during the last few years has shown that it has been able to serve the objective of providing estimates of area under crops by the due dates. Statistical supervision by whole time staff under the scheme has been helpful in improving timeliness and accuracy of the estimates. The scheme has also been able to meet the needs of data of irrigated area under crop as also area under high yielding varieties.

The ICS Scheme has been helpful in providing a deep insight into the actual state of affairs in the different States at the primary level of collecting area and yield statistics and in locating areas of weaknesses. The sample villages for the scheme being a sub-sample of the TRS villages for the year, the sample checks are helpful in revealing the actual manner of functioning of the TRS. A recent review of the findings under the scheme for the period 1973-74 to 1977-78 has brought to light some of the persistent deficiencies in the agricultural statistical systems of the States. For instance, in about 38 per cent of the survey numbers, discrepancies in recording of crop and crop area have been noticed between the supervisor and the primary worker. Similarly, in about 50 per cent of the crop villages the aggregation by the patwaris was found not to be correct. Further, only about two-thirds of the crop-cutting experiments were found conducted according to prescribed procedures, the major sources of departures being in reporting of ancillary particulars and in location and marking of plots. On the implementation of the TRS also, the sample checks

have revealed certain features such as the failure to complete in time the TRS girdawari in some villages and delay in submission of TRS statements.

While the basic aim of the ICS Scheme is to conduct quality checks on the primary work in area and yield statistics, it could be used for preparing advance estimates of area and yield as a by-product. A comparison of these estimates for the initial years with those under TRS and complete enumeration for area and with those under CES for yield rates revealed certain features, which were probed into by a Working Group of NSSO. The Group found that the differences in the area estimates under ICS on the one hand and TRS and complete enumeration on the other were due to : (a) differences in the targetted and surveyed populations, and (b) errors in aggregation in the official estimates at tehsil and higher levels, apart from sampling errors. Similarly, in regard to yield estimates, the differences were due, apart from sampling errors, to : (a) non-response arising not only from loss of experiments but also rejection of data collected under CES programme for quite a good number of experiments for the reasons that they are discrepant/unreliable, (b) not taking into account the data from the supervised experiments as such for building up CES estimates, (c) differences between the drilage ratios and stratum-wise crop areas used under the two schemes, and (d) differences arising out of stratification after the conduct of experiments adopted in some States. It is also important to mention that the Group came to the conclusion that if independent unbiased estimates of major crop areas, based on ICS data with 95 per cent accuracy are to be worked out, the present total sample size will be inadequate for most of the States.

The Group also made a number of recommendations regarding the technical aspects of design and estimation as well as the operational aspects of field work. The recommendations made for improving the operational aspects of field work emphasise the need for : (a) sample checks on verification of transfer and totalling of crop areas at the tehsil and higher levels, (b) conducting of sample checks in non-TRS villages and TRS villages not covered by ICS to provide information as to whether the patwaris in these villages tend to neglect the area enumeration work, (c) augmentation of the inspection of supervision work

under ICS, with an element of surprise inspection, (d) use of supervised data without any rejection in the calculation of CES estimates, and (e) proper collection and analysis of ancillary data under CES. While most of these are being implemented or taken up with the States for implementation, a programme for sample checks in non-TRS and non-ICS villages is yet to be launched.

The ICS scheme plays an important role in presenting a picture of the current state of affairs in the different States. The findings under the scheme are brought out in the form of Reports on the Status of Estimation of Agricultural Production for the different States for each agricultural season, together with recommendations for improving the system. These reports, which are considered in the High Level Coordination Committees on Agricultural Statistics constituted in the different States, have been found extremely helpful in deciding on the lines of remedial action to be taken.

Improving the quality is a continuous process. Changes in the agriculture of the country necessitate constant adaptation of the statistical system to these changes. The growing crop area under irrigation and high yielding varieties require that estimates of area and yield are available separately for irrigated and unirrigated areas and for high yielding and traditional varieties. The basic forms for area enumeration have been amended in most of the States to provide for reporting of these particulars. Similarly, guidelines have been formulated by NSSO for stratification of crop cutting experiments according to inputs. It is necessary to have an apparatus for providing an idea of the quality of data collected and improving it. The ICS scheme provides such an apparatus in so far as crop statistics are concerned.

Problem Areas

As a result of improvements and expansions in statistical activities during the last three decades, a larger mass of data are now available than before in agriculture and allied sectors. However, much still remains to be done with regard to improvement in the quality and timeliness of data in several areas. Some

of the important areas in which efforts need to be concentrated are:

- (1) There is an urgent need to cover some of the crops like small millets, other pulses, coconut, banana etc., under crop-cutting experiments and to increase the coverage of some of the crops presently covered but with low coverage rate, so that the overall reliability of crop output measurement is improved.
- (2) Estimation of production of individual fruits and vegetables should be done by adopting suitably designed sample surveys. At present, there is an urgent need to cover the important fruits and vegetables like apple, mango, citrus fruits and grapes, onion and tomato.
- (3) At present, there is a greater use of high yielding varieties of rice. To estimate the value of output of rice more correctly, there is an urgent need of variety-wise estimates of production and price data of rice.
- (4) Some studies relating to sugarcane crop are required towards the calculation of reliable utilisation rates in respect of seed rates and percentage of production consumed in chewing and juice-making.
- (5) Data on prices of certain crops like small millets and other pulses are not available. It is essential that efforts are made for collection of prices in such cases.
- (6) Continuous studies are required to work out : (a) utilisation rates, yield rates, conversion ratios of milk and milk products, (b) yield rates of meat and meat products for different categories of animals, the proportion slaughtered and estimates of fallen animals, (c) yield rates of goat hair, camel hair and pig bristle, and (d) estimation of operational cost of livestock products (ghee, butter, milk, hides, skins, eggs, poultry, wool, hair, honey, silk worms, cocoons).
- (7) For several items of inputs in agriculture including seed rates, use of fertilisers and feed, cost of livestock used on farm, the current data are hardly available. It is essential that the system is developed to obtain such data on a regular basis.

- (8) In forestry, efforts need to be made to : (a) record production of industrial wood, variety-wise and fuel wood and also to collect relevant price data, (b) estimate the minor forest products and their prices, and (c) evolve methodology for estimating under reporting and illegal removals of products. Lack of information on inputs and depreciation of machinery used in exploitation of forests also need to be looked into.
- (9) Scientific techniques should be developed : (a) to estimate the production of inland and subsistence fish and other fish products, and (b) cost of production for fishing industry.
- (10) For improving the quality of output data of certain by products like sticks, straws and stems of many agricultural crops, there is a need to extend the coverage of the existing crop-cutting experiments to collect dependable data on yield rates, conversion ratios etc., pertaining to such by-products in relation to output of the main crop at least on a sub-sample basis.
- (11) Greater emphasis should be laid on carrying out integrated surveys in agricultural and allied sectors in which besides data on output, information on related inputs, factor payment (*viz.*, agricultural wages, interest and rent) as well as capital expenditure under different categories of machinery and equipments like tractors, transport equipment, other equipments, construction in the form of land improvements, minor irrigation, grain golas, and inventory accumulation, are also collected.
- (12) The present scheme of cost of cultivation studies of the Directorate of Economics and Statistics, Ministry of Agriculture provides very useful data in respect of principal crops only; there is an urgent need for extending the scope of this scheme to provide more reliable input data on minor crops as well.
- (13) The quality of price data used in evaluation of both outputs and inputs leaves much to be desired. The prevalent system of collection of wholesale prices used as a proxy to harvest prices needs considerable strengthening on the lines recommended by a technical working group on prices set up by the CSO in 1975.

Concluding Remarks

The broad conclusion that seems to emerge from the foregoing review of agricultural and allied statistics used in the preparation of national accounts is that substantial gaps still remain under several categories and for removing existing data gaps and deficiencies, suitable steps are required to be taken by not one single agency but by all agencies dealing with the subject of agricultural statistics, both at the Centre and in the States. It is high time that all the State Agricultural Departments, State Agricultural Universities, Research Institutions under Indian Council of Agricultural Research, and NSSO orient their future studies keeping in view the present day need to fill the important data gaps. Regular collection of data annually on all the aspects listed may not be feasible due to constraints of resources; there is, therefore, an urgent need for having a critical look into these various gaps in data with a view to chalking out a systematic programme of data collection through field surveys to be conducted at regular intervals of say, 3 to 5 years.

Statement showing data base and procedure in estimating value of output from Agriculture Sector
(at current prices)

| Name of the crop/product/ by-product | Whether Statewise estimates are prepared | Data base for production (quantity) estimates | Price and their Sources | Procedure of estimation |
|--------------------------------------|--|---|-------------------------|-------------------------|
| (1) | (2) | (3) | (4) | (5) |

Principal Crops:

| | | | | |
|---|---|--|---|--|
| <p>*1. (i) Rice (ii) Wheat (iii) Jowar (iv) Bajra (v) Barley (vi) Maize (vii) Ragi (viii) Gram (ix) Arhar (x) Urad (xi) Moong (xii) Masur (xiii) Groundnut (xiv) Castor (xv) Linseed (xvi) Sesamum (xvii) Rape & mustard (xviii) Kapes (xix) Jute</p> | <p>Statewise estimates are prepared</p> | <p>Statewise forecasts of production based upon crop-cutting experiments brought out by DES-Ag. 'Estimates of Area and Production of Principal Crops in India'</p> | <p>State Statistical Bureaus (SSBs) supply whole-sale prices at primary markets which are used to calculate the State average price</p> | <p>Statewise production is evaluated at the State average price.</p> |
|---|---|--|---|--|

- (xx) Mesta
- (xxi) Tobacco
- (xxii) Dry chillies
- (xxiii) Potato
- (xxiv) Tapioca
- (xxv) Coconut

| | | | | |
|--------------------|------|------|--|------|
| **2. Small millets | -do- | -do- | Price data available for some (AP, MP) States. For others 75% of weighted average State-wise prices of jowar, bajra, barley, maize and ragi is used. (NSS Report No. 32, 5th to 7th Round : 1951-52 to 1952-53). | -do- |
| 3. Other pulses | -do- | -do- | Price data available for some States (A.P., Bihar, M.P., Karnotaka, Rajasthan). For others 75 per cent of weighted average Statewise prices of arhar, urad, moong and masur is used (NSS Report No. 32). | -do- |

*The percentage of area covered, at present, under the crop-cutting experiments is more than 90 per cent for the crops other than Ragi (87), Arhar (82), Linseed (52), Sesamum (45), Rape & mustard (40), Cotton (75), Coconut (75), Mesta (53), Tobacco (69), Dry chillies (32), Potato (54). In case of Urad, Moong and Masur, the percentage area covered under crop-cutting experiments is not known.

**Only 40% of the area is covered by the crop-cutting experiment and price is estimated on the price relationship norm based upon NSS Report No. 32. "Some aspects of cost of cultivation of agricultural crops" 5th Round to 7th Round.

| (1) | (2) | (3) | (4) | (5) |
|---|------|---|---|--|
| *4. Sugarcane & gur | -do- | -do- | SSBs furnish the prices paid by sugar factories and wholesale prices of gur | Quantity of sugarcane purchased by factories supplied by DES-Ag (Directorate of Sugar), is evaluated at prices paid by sugar factories and so is the quantity used for chewing and juice-making and seed-ing. The balance of the quantity is converted into gur and is evaluated at gur prices. The proportion of production for chewing and juice-making, seed rates and conversion ratio of cane to gur are based upon DMI report "Marketing to Our (1961 - 62)" (DMI-1962). |
| 5. (i) Niger-seed (ii) Safflower (iii) Sannhemp (iv) Cardamom (v) Black Pepper (vi) Dry Ginger (vii) Turmeric (viii) Garlic (ix) Corriander (x) Sweet potato (xi) Guar seed | -do- | Statewise DES-Ag forecast of production | SSBs supply the wholesale prices at primary markets which are used to calculate the State average price | Statewise production is evaluated at State average price. |

| | | | | |
|---------------------|-----------|---|---|--|
| 6. Arecanut | -do- | -do- | Directorate of Arecanut and Spices Development provides the wholesale Statewise prices of different varieties of arecanut marketed. These are averaged over the peak marketing periods. Producers' prices are arrived by making 20% deduction for processing and trade, transport margins | Statewise production : evaluated at State average price |
| 7. Banana | -do- | Statewise DES-Ag forecast of production | SSBs supply districtwise wholesale prices. A simple average of these district prices over the peak marketing periods is taken as the State average price | Statewise production is evaluated at State average price. |
| <i>Minor Crops:</i> | | | | |
| 8. Indigo | -do- | Statewise production data obtained from DES-Ag (Time-lag one year) | SSBs | Current year estimates are obtained on the basis of past trends. |
| 9. Tea | All India | Data about quantity of processed tea taken from Tea Board and quantity/value of processed and raw tea leaf taken from Annual Survey of Industries (ASI) | Only raw tea leaf constitutes the product from Agriculture. Total production/value of raw tea leaf are directly not available. The proportion of raw tea leaf is available in the latest de- | — |

*Area covered under crop-cutting experiment is 94%. Seed rate and percentage of production consumed in chewing and juice-making are based upon unpublished Report of DMI (1961-62).

| (1) | (2) | (3) | (4) | (5) |
|--|--|--|--|-----|
| | | | tailed ASI results applied to the processed tea leaf estimates for the current year | |
| 10. Coffee | Statewise | Statewise production from DES-Ag | SSBs | — |
| 11. Opium | -do- | Narcotic Commissioner | Narcotic Commission | — |
| *12. (i) Mangoes (ii) Citrus fruits (iii) Grapes | -do- | Area under these crops is taken from Indian Agricultural Statistics of DES-Ag and the yield rates are taken from the relevant DMI reports relating to 1962-63. | SSBs | — |
| 13. Cashewnut | -do- | Directorate of Cashewnut Development | Directorate of Cashewnut Development/SSBs | — |
| 14. Rubber | -do- | DESAg | SSB Kerala supplies the wholesale prices of sheet rubber at Kottayam market which is deflated by 28% to obtain producers' prices (based on Report of the Plantation Enquiry Commission on Rubber 1956, Ministry of Commerce) | — |
| 15. Papaya | -do- | DESAg | SSBs | — |
| 16. Onion | No separate estimates are prepared due to lack of data from all States. This crop is included under 'other Fruits and Vegetables'. | | | |

Unspecified and Miscellaneous Crops:

| | | | | |
|---|-----------|--|---|--|
| 17. (i) Other cereals (ii) Other oilseeds | All India | Production Estimates not available ; Area is given in 'Indian Agriculture Statistics' (DES-Ag) | Prices not available. For 'other cereals' 100% of weighted average value of yield/hectare of lowar, bajra, barley, maize and ragi and for other oilseeds, 85% of weighted average value of yield/hectare of lin- seed, sesamum and cas- tor are taken. (Based upon NSS Report No. 32) | By using data on area and-value of production) hectare |
| 18. (i) Other Sugars (ii) Other Fibres (iii) Other Dyes (iv) Other Drugs & Narcotics (v) Other Condi- ments & Spices (vi) Other Fruits & Vegetables | -do- | -do- | Prices not available ; value of . production/hectare taken as under : 'Other Sugars' =90% of value of yield/ hectre of gur 'Other Fibres' =90% of value of yield/hectare of mesta and Sannhemp 'Other Dyes' =90% of value of yield/ hectare of indigo 'Other Drugs & Narcotics' =90% of value of yield/ hectare of opium 'Other Condi- =90% of value of yield/ ments & hectare of cardamom, Spices' dry chillies, dry ginger and black pepper 'Other Fruits =100% of weighted & Vegetables, average value of yield/ including hectare of mango, onion' banana, citrus fruits, cashewnuts, potato, sweet potato and tapioca | -do- |

*Area estimates have 3 years' time lag.

| (1) | (2) | (3) | (4) | (5) |
|---|-----------|---|---|--|
| 19. Fodder | All India | -do- | Prices not available | NSS Report No. 65 (1956-57) Tables with Notes on Animal Husbandry 11th Round, provides estimates of production & price of fodder. The production estimates are moved forward on the basis of area and prices on the basis of straw prices. |
| 20. (i) Miscellaneous food crops (ii) Miscellaneous Non-food crops | Statewise | Area provided by DES-Ag in Indian Agriculture Statistics. | Values of yield/hectare for 1970-71 were provided for Miscellaneous Food Crops by Assam, H.P., A.P., Punjab & U.P. and for 'Miscellaneous Non-food Crops' by A.P., Assam, H.P., Kerala, Punjab, Tamil Nadu, U.P., Haryana. These are moved forward on the basis of Wholesale Price Index Number of Agricultural Commodities (Economic Adviser's). For remaining States, Rs. 40.00 per hectare in 1948-49 used by National Income Committee (1954) is moved forward by using the same Index. | Area x value of yield per hectre. |

Products and By-products:

| | | | | |
|--|-----------|--|--|--|
| 21. Fatmyard wood (industrial and fuel) | All India | Not available | Prices of fuel woods and industrial woods are supplied by SSBs/State Chief Conservators of Forests | The production for 1957-58 given in the report 'Timber trends & prospects in India 1960-75', Ministry of Agriculture, 1965) are moved on the basis of change in total area under : (i) miscellaneous tree crops and groves not included in net area sown, and (ii) fruits other than banana and grapes. These are evaluated at the prices of fuel wood and Industrial woods. |
| 22. Straw and Stalks | Statewise | DES-Ag provides data on area under different crops and NSS Report No. 32 gives zonal yield rates of different stalks and straws which are inflated by 14.4 per cent on the basis of NSS Report No. 65 | Prices provided by some SSBs; for others NSS Report No. 32 prices are projected on the basis of changes observed in the available data | — |
| 23. (i) Rice bran (ii) Rice husk | Statewise | DES-Ag provides production of paddy and 'Report on the Marketing of Rice in India' (DMI 1955) give yield rates of rice bran and husk/tonne of paddy. <i>Ad-hoc</i> wastage allowance at 5 % for bran and 25% for husk are made | Prices provided by SSBs | — |
| 24. (i) Cotton sticks (ii) Arhar sticks (iii) Sesamum sticks (iv) Jute sticks | Statewise | Production estimates not available | Prices not available | Production estimates are made on the basis of yield rates provided by some States : cotton sticks (T.N. and Punjab 1960-61), Jute sticks (West Bengal 1975-67). |

| (1) | (2) | (3) | (4) | (5) |
|----------------|-----------|---|---|---|
| 25. Cane trash | Statewise | Production of cane trash is taken as 10% of out-turn of sugarcane (based on 'Fertilizer Statistics', Fertilizer Association of India) | The prices of fodder are used | Arhar sticks (Rejasthan), Sesamum sticks (Punjab). Prices are moved forward on the basis of index of fire-wood prices (CSO) |
| 26. Bagasse | Statewise | Production is estimated at 45% of sugarcane used for gur production. 95% of bagasse is used as fuel for gur making and the balance 5% is evaluated only | The average Statewise ex-factory price for 1966-67 (ASI Report 1968) is adjusted on the basis of index of fire-wood prices | — |
| 27. Grass | Statewise | Production not available | Prices received from SSBs (Haryana, Kerala, Punjab, M.P., Rajasthan, Delhi and Manipur) are used and for other States the weighted average of the prices of the available states are used | Based on data given in NSS Report No. 65, the rural All India estimates of out-turn prepared for 1955-56 together with adjustment for urban areas are moved on the basis of changed and combined areas of pastures and grazing lands, fallow lands etc. The production estimates are allocated to States on the basis of Statewise combined areas of pastures etc. These are evaluated as per State prices. |

| | | | | |
|-------------------------------------|-----------|--|--|--|
| 28. Tobacco stem | Statewise | Tobacco stem production is taken as percentage of tobacco leaf production which varies among the States | 50 per cent of tobacco leaf price | — |
| Livestock | | | | |
| 29. <i>Milk and Milk Products :</i> | Statewise | The Statewise production of cow and buffalo milk is estimated separately on the basis of milch animals, proportions in milk and milk yield rates. Surveys conducted by NSSO, States Animal Husbandry Departments IASRI provide data on proportions of milch animals in milk and their yield rates. Regarding goat milk production data on the various constituent factors supplied by DMI are being used for States other than A.P., Tamil Nadu, Karnataka, West Bengal and Pondicherry. Data on utilization rates of fluid milk and conversion ratio of milk into ghee, butter and lassi were supplied by DMI in 1968 (unpublished) | Wholesale prices usually for urban areas are supplied by SSBs which are adjusted for rural/urban price differentials and trade margins | The annual estimates of production are prepared by estimating the different categories of animals on the basis of the last 2/3 consecutive Indian Livestock Censuses (ILCs); the proportions of milk animals to milch animals and their yield rates. |
| (i) Milk consumed as such | | | | |
| (ii) Ghee | | | | |
| (iii) Butter | | | | |
| (iv) Lassi | | | | |
| 30. <i>Meat and meat products :</i> | Statewise | The Statewise estimates are prepared by using data on number of animals slaughtered and yield rates for different categories of animals. The Statewise proportions of slaughtered to the total animals' populations by categories are based on DMI data for the year 1967-68 and information from SSBs in respect of Maharashtra, Delhi, and U.P. The yield rates of meat are based | Wholesale urban prices are supplied by SSBs which are adjusted for rural/urban differentials and trade margins. | I do— |
| (i) Beef | | | | |
| (ii) Buffalo meat | | | | |
| (iii) Mutton | | | | |
| (iv) Goat meat | | | | |
| (v) Pork | | | | |
| (vi) Edible offals | | | | |
| (vii) Fat from slaughtered animals | | | | |

| (1) | (2) | (3) | (4) | (5) |
|---|-----------|---|--|-----|
| <p>(viii) Fat from fallen animals (ix) Heads & legs (x) Guts (xi) Oesophagus (xii) Blood (xiii) Tailstumps (xiv) Useless meat</p> | | <p>on data from DMI in 1972, IASRI (for Tamil Nadu) Animal Husbandry Departments, Uttar Pradesh and SSB, Bihar. The basic data on yield rates of other products are taken from DMI (1961) which also gives proportion of fallen animals.</p> | | |
| <p>31. <i>Hides and Skins</i> : (i) Cattle hides (ii) Buffalo hides (iii) Sheep skins (iv) Goat skins.</p> | Statewise | <p>Number of hides & skins are obtained from number slaughtered and number fallen due to natural death. The estimates of fallen animals given in MR (DMI-1961) are projected by using the the animal populations of different categories</p> | <p>Wholesale prices obtained from SSBs are adjusted for trade margins</p> | — |
| 32. Wool & Hair | Statewise | <p>The Statewise production is estimated on the basis of number of sheep & the yield rates. The wool yield rate (clipped) per sheep are provided by the surveys (published/unpublished) conducted by IASRI and some State Animal Husbandary Departments. For the States for which these rates are not available, data on yield rates of the adjoining States are used. The number of sheep are based upon ILC data. The 'pulled' wool estimates are based on number of sheep slaughtered and 'pulled' wool rates taken from relevant MR (DMI-1964).</p> | <p>Prices supplied by the SSBs duly deflated for trade margin are used</p> | — |

33. (i) Goat hair
(ii) Camel hair
(iii) Pig bristle

Statewise

Number of animals are based on the ILC data. The rates for goat hair and pig bristles are taken from relevant MRs (DM 1961-62) and for camel hair, information received from DMI for 1958-59

For goat hair & pig bristles export prices given in 'Monthly Statistics of Foreign Trade in India' are arbitrarily deflated by 20%. Camel hair prices are taken as well 45.3% of wool prices on the basis of MR (DMI-1946)

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34. Eggs and Poultry
meat
Eggs

Statewise

The estimates are prepared on the basis of Statewise number of layers worked out using ILC data and yield rates of eggs per layer taken from the State Animal Husbandry Deptts. Poultry Surveys and the results of IASRI Surveys available in the article "Poultry Eggs Production and its per capita availability in India"—Indian Journal of Animal Production, Dec. 1972. Allowance for wastage, proportion of eggs for consumption & hatching obtained from these surveys are also utilised

Average wholesale prices provided by SSBs are deflated for trade and transport margins and rural/urban differentials

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35. Poultry meat

Statewise

Estimates of slaughtered fowls and chickens are derived from poultry (chickens and adult fowl) population in the two consecutive years using ILC data and the estimates of annual hatchings

SSBs provide the prices per slaughtered adult fowl and chicken

—

| (1) | (2) | (3) | (4) | (5) |
|--|-----------|--|--|-----|
| 36. Dung | Statewise | Estimates are prepared using evacuation rates of dung per bovine collected by IASRI/State Animal Husbandry Deptts. during milk production surveys and the number of bovines estimated on the basis of ILC data. For States for which no survey results are available, the rates pertaining to adjoining States are used. These estimates are then classified into dung used as manure and dung used as fuel using State-wise proportions supplied by IASRI (1972). Dry dung taken as 40% of green dung | Prices for dry dung are provided by SSBs. For dung manure, prices are provided by some SSBs which are also used for which prices are not available | — |
| 37. Increment in livestock | -do- | Increase in number of different categories of livestock are estimated on the basis of projected population using ILC data | SSBs provide the prices of different categories of livestock | — |
| <i>Other Products:</i> | | | | |
| 38. (i) Bones (ii) Horns (iii) Hoofs | -do- | The yield rates of bones per animal of different category of horns and hoofs from relevant MR (DMI 1957) and (DMI, 1961) are applied to the estimated slaughtered and fallen animals | Bone prices are provided by SSBs. For horns and hoofs, prices received earlier are moved forward by applying price index of meat | — |
| 39. Silk worm cocoons | -do- | Out-turn and value estimates provided by Central Silk Board | — | — |

| | | | | |
|---------------------------------|-----------|---|---|---|
| 40. Honey | -do- | Outturn and value estimates provided by Khadi and Village Industries Commission | — | — |
| <i>Inputs:</i> | | | | |
| 41. Seed | -do- | Cropwise consumption is estimated on the basis of seed rates made available from various sources viz., cost of cultivation studies (DES-Ag), MR Reports, NSS Report No. 32 and various studies conducted by States | State average prices of the crops are used | — |
| 42. Fertiliser | All India | Data on materialwise off-take of chemical fertilisers are available in 'Fertilizer Statistics' (Fertiliser Association of India) which is used as a close approximation to the consumption materialwise data | Data on materialwise price are given in 'Fertiliser Statistics' | — |
| 43. Organic manure | All India | Estimates of consumption are prepared by using data given in NSS Report No. 140 (11th Round: 1956-57) and the Report of Farm Management Statistics (DES-Ag). The base year estimates are projected on the basis of changes in given area sown in each State | The base year prices are moved on the basis of change in dung prices. | — |
| 44. Pesticides and Insecticides | All India | Value of consumption data provided by Pesticides Association of India | | — |

| (1) | (2) | (3) | (4) | (5) |
|---|-----------|---|---|-----|
| 45, Livestock Feed (for animals used in Agriculture activities) | All India | <p>Total cost of feed of all animal is estimated as under :</p> <p>(1) Entire value of fodder, cane-trash, grass, rice bran,</p> <p>(2) 95 per cent value of stalks and straws,</p> <p>(3) 85 per cent value of cotton seed.</p> <p>(4) 1 per cent value of rice and wheat 2 per cent value of jowar, bajra maize, ragi, other cereals, 5 per cent value of small millets</p> <p>(Based on <i>Population & Food Planning in India</i> by Baljit Singh (1947).</p> <p>(5) 35 per cent value of gram (based on NSS Report No. 65),</p> <p>(6) 55 per cent value of groundnut oil cake, 80 per cent value of linseed cake, 60 per cent value of coconut cake, 60 per cent value of cotton seed cake.</p> <p>(based on <i>Oilseeds in India 1954-55</i>, DES-Ag).</p> <p>(7) Rs. 1.62 per cattle equivalent of salt, medicines and miscl. feed in 1955-56 (based on NSS Report No. 65) are moved on the basis of index number of wholesale price of salt (EA)</p> | <p>Total cost of feed is distributed between Agriculture & Non-Agriculture sectors in proportion to respective number of animals converted into cattle equivalents using cattle Equivalence scale from 'Economic Effects of Irrigation' by D. R. Gadgil (1948).</p> | — |

| | | | |
|---|-----------|--|--|
| 46. Irrigation charges | Statewise | Available in the State Budgets | |
| 47. Cost of Electricity | Statewise | Data on quantity consumed & price per unit electricity are obtained from Central Electricity Authority | |
| 48. Diesel oil | Statewise | Estimates are prepared on the basis of number of tractors supplied by SSBs & diesel engines (based on <i>Indian Livestock Census Data</i>) The consumption per unit is based on data collected from SSBs | Retail prices are supplied by Indian Oil Corporation |
| <i>Market Charges:</i> | | | |
| 49. For Agriculture | All India | The ratio of market charges to gross value of output based on ' <i>Rural Credit Survey 1951-52</i> ' (RBI 1954) is being used. | |
| 50. Livestock (for ghee, butter, and meat) | All India | Data on market charges given in the MR on milk and butter (DMI 1957) and Meat (DMI 1955) are used to estimate the ratio of market charges to output. These ratios are assumed to remain unchanged for preparing estimates for subsequent years | |
| 51. Operational Cost of Livestock Products (towards current expenditure on the production of ghee, butter, milk, hides, skins, eggs, poultry, wool, hair, honey, silkworm, cocoons) | All India | Operational cost based on limited data are taken as Rs. 267.92 per tonne for ghee and butter and 0.25 per cent of the value of output for other products | |

| (1) | (2) | (3) | (4) | (5) |
|--|-----------|--|-----|-----|
| <p>52. Current expenditure on repairs and maintenance :</p> <p>(a) Agricultural machinery, implement & transport equipment,</p> <p>(b) non-residential buildings, <i>i.e.</i>, farm houses, grain golas, cattle sheds,</p> <p>(c) other construction works, <i>e. g.</i>, bunding and other land improvements, wells, other irrigation resources</p> | Statewise | <p>The estimates are prepared separately for (a), (b) and (c) groups. AIDIS (All India Debt and Investment Survey) (RBI) (1971-72) provide Statewise data on repairs and replacements and one-third of this is assumed to form the expenditure on repairs and maintenance. Regarding (a) and (b), the capital stock at (1970-71) prices are first prepared and for subsequent years by adding annual figures of net capital formation at (1970-71) prices. The estimates of repairs and maintenance are obtained by applying the proportion of expenditure on 'repairs and maintenance' to the value of Capital Stock which is assumed to remain unchanged. These are adjusted for price changes to obtain current price estimates. Regarding (c) the point estimates are moved with the help of constant price value added in the unorganised sectors. Adjustment for urban areas are done on the basis of ILC 1972 (urban assets 3.1 per cent of rural assets)</p> | — | — |
| <p>53. Consumption of fixed Capital (a), (b) and (c) as per item 52 above</p> | Statewise | <p>Regarding (a) and (b) consumption of fixed capital is estimated from the value of capital stock and average life of these assets.</p> | — | — |

average life for (a) is taken as 9 years on the basis of SSBs data and 50 years for (b). In case of (c) the consumption of fixed capital for 1971-72 is taken as the sum of expenditure on replacement only, *i.e.*, the two-third of expenditure on repairs and replacement and expenditure on major alterations in respect of bundings, land improvements, wells and other irrigation resources. The point estimates are moved with the help of value added in the unorganised sectors to obtain estimates for subsequent years.

Forestry :
54. Major products Statewise

SSBs/State Chief Conservators of Forests (CCFs) provide data on production of industrial and fuel wood. The estimates of under-reporting and illegal removals are assumed to be 10% of the recorded production (Report *Timber Trends and Prospects in India-1960-75*) Ministry of Food and Agriculture, 1962)

State CCFs/SSBs provide the wholesale prices which are adjusted for trade and transport margins based on *'Timber Trends Study for the Far East : Country Report for India'* (I.G. of Forests, 1958)

55. Minor Products -do-

Information is available in the form of royalty value or contract fee realised by the Government and not the economic value of output. The value of output is estimated indirectly by using the ratio of the total value of output (recorded and unrecorded) to the royalty value of major forest products. However, information on production and

| (1) | (2) | (3) | (4) | (5) |
|------------------|-----------|---|--|-----|
| | | prices for some minor products (resin in H.P.; Bidi leaves and sandalwood in A.P. etc.) are provided by some States CCFs which are also made use of | | |
| 56. Inputs | Statewise | The operational costs and repairs and maintenance are assumed to be 4% of value of output and consumption of fixed capital at 1% | | — |
| <i>Fishing :</i> | | | | |
| 57. Marine | -do- | Statewise Data on marine catch are provided by Central Marine Fisheries Research Institute or State Fisheries Departments (SFDs) | State Fisheries Deptts./ SSBs provide the price data | — |
| 58. Inland | -do- | State Fisheries Deptts. provide the data of inland catch for all states other than Assam, West Bengal, Bihar for which SSBs provide the estimates | SSBs/SFDs provide the price data | — |
| 59. Subsistence | -do- | No direct estimates available; derived as some percentage varying from 2.5% to 25 % of inland fish output | — | — |

| | | | | |
|--|------|--|---|---|
| 60. Inputs and consumption of fixed capital. | -do- | No direct estimates are available. Estimates are being prepared as some percentages of output | — | — |
| 61. Value added from Fish curing (salting and sundrying) | -do- | SSBs/SFDs provide data on quantity and price of fish cured, salt used and fish let-in. | — | — |
| 62. Other Products | -do- | The estimates of net value added are prepared on the basis of persons engaged in such activities (using Population Censuses data) and net value added per worker | — | — |