

SYMPOSIUM ON CURRENT STATUS OF FORESTRY STATISTICS IN INDIA

A symposium on "Current Status of Forestry Statistics" was held on 17th December, 1968 during the 22nd Annual Conference of the Society at Patna. Shri S.P. Shahi, Chief Conservator of Forests, Bihar, presided over the symposium. Extended summaries of the remarks made by the speakers who participated in the symposium are given against the topics on which they spoke.

Shri R.S. Chadha¹: *Current Status of Forestry Statistics in India*

Forestry plays an important part in the economy of the country. According to the Revised Series of National Income issued by the Central Statistical Organisation, forestry and logging contributed about 254 crores to the National Income of India during 1964-65 or roughly 1.23%. Most of the forest produce consists of raw materials needed for various types of industries and, therefore, plays a much more important role in the country's economy than what the figures themselves signify. There are also opportunities for employment to a considerable number of people not directly concerned with exploitation of forests. Much of the forest produce meets the essential requirements of defence, communications, industry and other general purposes of public importance

While the direct contribution of forests to national wealth is by no means insignificant, even more significant are their indirect influence on the climate and land economy of a predominantly agricultural country like India. Besides, forests help in moderating the climatic extremes, controlling floods, regulating stream flow and protecting the soil against accelerated erosion by wind and water.

1, Directorate of Economics and Statistics, Krishi Bhawan, New Delhi.

Scientific forestry in India is a little over 100 years old. While historically, interest in scientific forestry was roused in the first half of the nineteenth century, there was no attempt at converting forests into a productive source of industrial strength and in maximising areas under forests till 1894 when the first forest policy resolution was issued. In 1952, Government of India enunciated a new forest policy to replace the 1894 policy. While the fundamental principles underlying the 1894 policy were reiterated, Government of India, thought it fit to lay greater emphasis on a number of other points. It proposed the classification of forests on a functional basis into protection forests, national forests and village forests. It emphasised the need for evolving a system of balanced and complementary land use, under which each type of land was to be allotted to that form of use under which it would produce more and deteriorate least. The policy considered it desirable to establish tree lands wherever possible for the amelioration of the physical and the climatic conditions, and for promoting the general well-being of the people. It also laid down the aim of putting one-third of the country's area under forests. The national policy further cautioned against indiscriminate extension of agriculture by destruction of existing forests, as this not only deprives the local population of wood, grass, etc., but also deprives the land of its natural defences against dust storms, hot winds and erosion.

Under the Constitution, forestry is a State subject and the Central Government is chiefly concerned with the implementation of National Forest Policy, coordination, forest education at professional and sub-professional levels, research and training. The Directorate of Economics and Statistics in the Central Ministry of Food, Agriculture, Community Development and Cooperation is responsible for collection, compilation and publication of forest statistics. For this purpose the Directorate maintains close liaison with the State Governments and the Inspector General of Forests, who is in charge of all matters of forestry and wild life at the Centre.

The Government-owned forests in the States are under the administrative control of the respective State Governments. Most of the States have a Chief Conservator of Forests who is responsible for the administration and management of the State forests. The organisation of the Forest Department in the States is generally as follows :

Chief Conservator of Forests

(Head of the Deptt.)—Conservator of Forests (in-charge of a territorial circle or functional circle)—Deputy Conservator of Forests/Asstt. Conservator of Forests (Divisional Forest Officer in-charge of a functional Division)—Forest Range Officer (in-charge of a range)—Deputy Ranger/Inspector (in-charge of sub-ranges or sections)—Forest Guard (in-charge of a beat).

Collection of Forest Statistics: The collection of forest statistics was taken up from the point of view of administrative needs of Forest Departments. Upto 1946-47, the available forest statistics in respect of British Provinces and Centrally Administered Areas alone used to be given in 'Annual Returns of Statistics relating to Forest Administration in India'. Consequent upon the integration of Princely States with Indian Union after Independence, the coverage of forest statistics gradually increased with the extension of the reporting system to the erstwhile State forests.

The growing needs of the country for cellulosic raw material, necessitated intensive development of forestry. The Five-Year Plans afforded an opportunity to undertake suitable measures to fulfil this objective. During the first three Plans, an expenditure of about Rs. 77 crores was incurred for development of forestry. The schemes included, among others, consolidation of forests, rehabilitation of degraded forests, improvement of communications, mechanisation of operations and raising of plantations to meet the growing demand for wood, particularly by the wood based industries. For formulation and implementation of various schemes comprehensive statistics were needed. Attempts were, therefore, made to enlarge the scope of the existing data to meet the growing needs of reliable information for development of forestry and forest industries.

Availability of Forest Statistics: Forest statistics flow as a bye-product of forest administration. At the Centre, the Directorate of Economics and Statistics collects data on forestry from the State Forest and Revenue Departments. Principal forest statistics relate to (i) areas under forests according to ownership types; legal status, economic management or exploitation and composition, areas closed and open to grazing, areas protected from fire, areas surveyed and unsurveyed; (ii) demarcation and maintenance of forest boundaries,

progress of forest settlement ; (iii) afforestation ; (iv) volume of standing timber and firewood ; (v) outturn both in terms of quantity and value of different types of timber and firewood and minor forest produce ; (vi) revenue and expenditure of State Forest Departments ; (vii) employment of labour in forestry and forest industries ; (viii) grazing of cattle in Government forests ; (ix) Foreign Trade ; and (x) Miscellaneous statistics like breaches of forest rules, progress of working plans etc. These data are generally published in Indian Forest Statistics and other brochures issued by the Directorate of Economics and Statistics. Upto 1957-58, the scope of forestry statistics published by the Directorate of Economics and Statistics was limited. To enhance the utility of forest statistics with a view to meet the requirements of forestry development and administration, a number of new items of information have been added since 1958-59. Among others, these new items relate to :—

- (a) Area of forest surveyed with topographical details ;
- (b) Area afforested and deforested ;
- (c) Classification by management status, silvicultural system and its density ;
- (d) Outturn of logs and sleepers ;
- (e) Wholesale prices of forest produce.

The Central Statistical Organisation issues estimates of income from forestry as part of overall National Income Statistics in the country. The Department of Agriculture also collects some data on forestry from the State Government on ad-hoc basis. As part of overall statistics of foreign trade, the Department of Commercial Intelligence and Statistics publishes data on imports and exports of forest products.

Forest Area Statistics : Data on area under forests are collected separately for "Coniferous or Soft-wood", "Non-Coniferous or Broad leaved" according to various ownership categories, viz., (i) States ; (ii) Corporate Bodies ; and (iii) Private Individuals. It may be mentioned that about 96 per cent of the country's forest area is State owned and managed by the State Forest Departments. Forest area owned by Corporate Bodies and Private Individuals thus forms only about 4 per cent of the total area. To have an idea of the extent of forests within the reach of economic management or exploitation as sources of forest products, the forests are

further sub-classified into "Merchantable" and "Unprofitable or Inaccessible". Data on area under "reserved", "protected" and "unclassified" forests are also collected and published by the Directorate separately for "Coniferous" and "Non-coniferous" categories. Area figures are also available by composition. Coniferous species for which area figures are available are Deodar, Chir, Kail, Fir and others. Among non-coniferous species, area data are available for Sal, Teak, Sisso, Diptero-Carpus and others.

Outturn of Forest Produce : (a) Major Forest Produce : Statistics of outturn of major forest produce in State, Corporate Bodies and Private forests are available for timber, roundwood, pulpwood and matchwood, firewood and charcoal wood, both in terms of quantity and value. The data are further classified into 'coniferous' and 'non-coniferous' forests. Data are also available for sawn timber (sawn logs, vancer logs and sleepers), roundwood (pulpwood, pitprops and pole pilings and posts), wood for charcoal and distillation. Species-wise data on outturn are available for Deodar, Chir, Kail, Sal, Teak, Sisso, Simul, Dipterocarpus Spp. and other species. It has been observed that data in respect of 'Corporate Bodies' and 'Private Forests' are incomplete as information is not available in respect of some States. Further, even in the case of States for which data for Private forests are available, these do not possess the same degree of accuracy as those in respect of forests controlled by the State Forest Departments.

(b) Minor Forest Produce : Statistics of value of outturn of minor forest products are available for bamboos and canes, Drugs, Fibres and flosses, Fodder and Grazing, Grass other than fodder, Lac, Gums and Resins, Dye-stuffs and Tanning Materials, Bidi leaves, Vegetable oils and seeds, Charcoal, Ivory, Honey and Bees-Wax. As in the case of major forest produce, figures are given separately for State, Corporate Bodies and Private Forests. In the amplified proformas prescribed for collection of forest statistics provision has been made for outturn of minor forest products in quantitative terms also. But, however, the response from the State Govts. has not been very encouraging. It is suggested that necessary provision for recording of quantity of outturn of minor forest products should be made in the basic and abstract forms used for the collection of forest statistics at different levels. Information on estimated value of forest produce, both major and minor given away

free or at reduced rates is also published in Indian Forest Statistics. Information on unauthorised removals of forest produce is, however, not available and as such the data on outturn published in Indian Forest Statistics are incomplete.

Divergence between different sets of figures of area under forests: Statistics of area under forests are published in Indian Agricultural Statistics, based on land-use data received from the State Agriculture or Revenue Departments or State Bureaus of Economics and Statistics. It has been observed that these figures differ from those published in Indian Forest Statistics on the basis of returns received from the State Forest Departments. The reasons for divergence between the figures of area under forests furnished by two agencies have been examined from time to time in consultation with the State Governments and may be grouped under the following broad heads :

- (a) Difference in the definitions of "area under forests" adopted in the two publications ;
- (b) Incompleteness of survey and demarcation of forest area ;
- (c) Lack of proper accounting of the forests in areas non-reporting for land-use statistics ;
- (d) Differences in original forest and revenue records and irregularity in maintaining them up-to-date ;
- (e) Difference in the reference periods of the two sets of data.

The Standing Committee on Improvement of Agricultural Statistics has in consultation with the I.G.F. recommended inter-alia the following revised definition of "area under forests" for adoption by both the Revenue and Forest Departments of the States :—

"Area under forest includes all lands classed and/or administered as forests under any legal enactment dealing with forests, whether State owned or private and whether wooded or maintained as potential forest land." This definition has been accepted in principle by the States and it is hoped that the differences in the two sets of forest area figures would be narrowed down considerably if not altogether eliminated.

Volume of Standing Timber and Fuelwood: Efforts are being made to collect data on volume of standing timber, gross increment,

natural losses by fires, insects and diseases and climatic factors, net increment, fellings, and actual removal separately for State, Corporate Bodies and Private Forests, sub-classified into 'coniferous and non-coniferous' forests. These data are at present not available for some States and as such, an all-India picture is still lacking.

Employment of Labour in Forestry and Forest Industries: Data on number of persons employed annually in management (silviculture), Extraction and Primary and Secondary industries alongwith superior staff, subordinate forest staff, clerical and other miscellaneous and subordinate staff and permanent labour force in forestry is published annually.

Consumption of Major and Minor Forest Produce: Provision has been made for collection of data on tentative estimates of annual consumption of timber, roundwood, pulp-wood, firewood, charcoal wood and several categories of vegetable products in the amplified proformas. These data received from some of the states only are, however, far from reliable and complete. Suitable surveys for estimation of consumption of various products need to be conducted to make the data reliable and dependable.

Wholesale Prices: Data on annual average wholesale prices of various species of timber, sleepers, firewood, pulpwood, plywood, etc. are published for important marketing centres in different States. Some data on prices are also published in the State Gazettes and Bulletins issued by the State Governments. Indian Census of Manufactures and Annual Reports of the Railway Board also give some data on prices.

Progress in Concentrated Regeneration and Afforestation: Figures of area under concentrated natural regeneration, area regenerated mainly by Coppice, area artificially regenerated and total cost of regeneration operations are published separately for State, Corporate Bodies and Private forests.

Miscellaneous Statistics: Statistics on the following items are also published in Indian Forest Statistics :—

- (i) Area for which Reliable Estimates of growing stock are available.
- (ii) Classification of forests in use.

- (a) Management Status (good cutting, fair cutting and poor or destructive cutting).
- (b) Silvicultural system (High Forests, Coppices, open areas).
- (c) Density (Good, Medium, Poor).
- (iii) Revenue and Expenditure of Forest Deptts.
- (iv) Grazing of animals in Government Forests.
- (v) Games shot in Forest Areas.
- (vi) Demarcation and Maintenance of Forest Boundaries.
- (vii) Expenditure on communications and buildings.

Market Analysis and Surveys : With a view to finding out the current and anticipated demand for wood and wood products a Timber Trends Survey was undertaken for the first time in 1958. The report on this survey gives useful information on forestry and forest industries. It was the first attempt at estimating the unrecorded production of timber and fuelwood. Private forests and to some extent unreserved forests, farm yards, village commons, field ridges, canal banks, roadside avenues, individual household courtyards and unproductive fruit trees form the main sources of this unrecorded production. By providing the estimates of unrecorded production, the report has filled an important gap in the official forest statistics.

A Pre- Investment Survey of Forest Resources was initiated in 1965 with the assistance of the UN Special Fund covering an area of 29,785 sq. kms. The project is nearing completion. On analysis of survey results, useful information on various aspects of forestry and possibilities of industrial development in the areas surveyed would be available.

Income from Forestry : Annual estimates of national income and income from various sectors including forestry are prepared by the Central Statistical Organisation. The details will be provided by another participant.

Suggestions for Improvement : The existing data on forestry suffer from a number of defects. For example, for most of the States, statistics are at present available in respect of State forests only. In order to have a complete picture of the volume of existing stock

and outturn on annual basis, it is necessary to build up estimates in respect of the private forests also. Statistics of trees outside forests also need to be collected periodically say once in five or ten years. This could be done by including a few questions in the Decennial Agricultural Censuses. For improving the estimates of income for agriculture, periodical studies on cost of felling, cost of rough hewing and topping etc., cost of transportation from stump to assembling markets, cost of regeneration, details of the expenditure on new plantations etc. are necessary. As in the case of agricultural crops, regular arrangements for reporting of wholesale prices for different types of forest products from a large number of assembling and marketing centres need to be made. Further, there is at present a considerable time-lag in the publication of forest statistics. To inform their usefulness, it is necessary that the time-lag should be reduced to the minimum.

With the emergence of forestry as an organised undertaking, there is a growing interest and emphasis on the study of economics of forestry. New types of data are needed for formulation and execution of development programmes. These include estimates of demand and supply of various products over a period of 10-15 years, economics of raising new plantations, possibilities of exploitation of hitherto unexploited forests and data on operational and administrative aspects of forestry. As already mentioned above, some improvements in the quality and content of forest statistics have already been effected during recent years. Yet it is felt that the presently available data are inadequate for formulation of sound plans for forestry development and their implementation and for assessing the contribution of forestry to the National Income of the country. The scope of forestry statistics has, therefore, to be enlarged further to collect data on other aspects in line with the developed countries of the world. To provide for the long-term requirements of data for forestry development, a minimum programme for collection of forest statistics needs to be laid down. To improve the reliability and to ensure inter-State comparability, it would further be necessary to examine the basic forms used for maintenance and abstraction of basic data on different aspects of forestry at different levels such as Sub-Range, Range, Division, Circle and State and to lay down uniform concepts and definitions. It is suggested that a Technical Committee may go into these questions and suggest measures for strengthening the statistical base for collection of forest statistics.

Statistical Cells in Forest Departments: To cope with the increased work of collection of forest statistics and to ensure accuracy of different types of data flowing from the State Forest Departments, a Statistical Cell needs to be set up in the Forest Department of each State. This Cell will also be in a position to guide research in forestry and planning of field experiments and to train the field staff in the methods of collection of forest statistics.

Shri G.S. Chandras² : *Present Status of Forest Statistics in India and measures suggested for its improvement*

(a) **National Level**

For the national level, the '*Yearbook of Forest Products (Statistics)*' is the only regular source of publication which provides fairly extensive information against the individual countries. This annual series published by the Food and Agriculture Organization of the United Nations is available since 1947 onwards to this date. Area, Production, Consumption and Trade are the main sections under which aggregate information for each country has been tabulated therein.

Indian Forest Statistics: Next to that is the '*Indian Forest Statistics*' series published by the Union Ministry of Agriculture, Government of India. This was a very useful series which covered aspects of area analysis, production, revenue and expenditure and other miscellaneous items. It also provided a Statewise break up. But unfortunately since 1958-59 onwards, no publication in this series has come out.

It seems important to understand as to the circumstances in which '*Indian Forest Statistics*' series which was brought out from 1875-76 to 1957-58 could not be continued thereafter. This publication has always facilitated a research worker in building up a time-series on many aspects. All efforts need to be mustered not only to restore the '*Indian Forest Statistics*' series preferably with retrospective effect but even to strengthen it by addition of more useful and important information on basic or modern aspects.

Recently, the statistical cell of the Central Forestry Commission, at New Delhi has started issuing occasional bulletins each covering a separate topic.

Statistical Abstract of the Indian Union (1840 to 1966) and the *Indian Agricultural Statistics* (1884-85 to 1962-63) have been additional regular sources of published statistics on limited aspects.

Then there are some more publications etc. which provide annual information on some specialised topics, viz, transport movements, wholesale price indices, etc.

Apart from the above publications which include information on the annual basis, there are some occasional publications which contain valuable information, viz., Timber Trend Surveys, Centenary Volumes, Forestry Conference Reports etc.

(b) State Level

It is evident that the 'Indian Forest Statistics' series was compiled on the basis of information supplied to the Union Ministry by individual states or territories. A detailed study into the manner in which the information is compiled in an individual state or territory should be of interest to those who are keen in devising ways and means for the improvement of the structure of forest statistics. The case of Maharashtra State is treated here as an example for this purpose and it is likely that description of the manner etc. will apply to other states also partially or wholly.

Among the component states, Maharashtra (erstwhile Bombay Province) was perhaps the foremost to create an office of the 'Forest Statistician' in the year 1949. During those times, for example, annual forest statistics used to be included in the following publications :--

- (i) Annual Administration Report of the State Forest Department.
- (ii) Annual Report of the Forest Utilization Officer of the State.
- (iii) Price-bulletins.

As against the above-mentioned publications which were brought out by the State Forest Department, there have been some more publications of a wider coverage in which forest statistics has formed one of the component parts.

The Annual Publications by Bureau of Economics and Statistics, Maharashtra, include :—

- (a) Statistical Abstract of Maharashtra State; and
- (b) Handbook of Statistics of Maharashtra State.

The Occasional Publications include :—

- (a) The Forest Working Plans which contain a very valuable bunch of statistics for the respective forest areas. Census of trees, site-quality classification of areas, rates of growth of trees etc. are amongst the main features of the data available therein.
- (b) Miscellaneous publications like the Centenary Souvenirs etc.

Paucity of Forest Statistics : Being a 'state subject' it was perhaps not possible to maintain uniformity in the details of the forest statistics which could be built up annually by the individual states or territories. It will not serve much useful purpose here to go into more details about the causes behind the present condition of forest statistics in India as a whole and in the individual states. But the effects of the lack of statistics or of bad statistics became felt rather too prominently in the present decade when a serious thought was being given to apply the process of planning to the Forestry Sector which by that time had been brought almost fully within the fold of public sector.

The question of compilation of statistical data did not receive a serious attention even after Independence and consequently during the course of the first three Five Year Plans, a provision for purposeful collection of the required statistical data remained to be made. Thus planning in forestry suffered directly owing to the lack of relevant data and today this handicap is being experienced to the utmost extent at the time of the formulation of the Fourth Plan. The only solace is that now a provision for this important function is considered important and a special scheme on that account is accordingly proposed to be included in the Fourth Plan.

The last and present planning in Indian forestry has been made on the basis of only habit and experience. For want of adequate data, it has not been possible so far to apply the sophisticated methods which provide effective planning tools. In fact, nobody will dispute that planning in forestry is much more in need of these modern sophisticated methods than other sectors because of the momentous roles forestry has to play in national economy, *viz.* : Soil and water conservation; minimising damage by floods and famine; employment and development of the forest-dwellers; production of wood and minor forest products including fodder; wild-life management and recreation, and so on.

Forestry planning involves consideration of investment criteria based on cost-benefit analysis, risk and uncertainties and advantages associated with the public sector undertakings and particularly on specific aspects like decision-making, execution and control.

Special Statistical Cells: Among the 'Central Schemes' there is a special provision of a 'Statistical and a Planning Cell' in the Ministry of Food and Agriculture of the Government of India.

“ The proposed cell would assess and evaluate the State forestry schemes, their physical and financial progress, shortfalls in achievements etc. It would determine the procedures for the collection of forestry statistics in general, collect and compile the data received from the States and evaluate them. . . . This scheme was proposed for advance action in the Third Plan. . . . Outlay proposed for the Fourth Plan Rs. 5.00 lakhs.”

From the aforesaid, it can be seen that assessment and evaluation of the state forestry schemes, and organizing surveys etc., would be included amongst the functions of this cell.

What is the present stage of the establishment of this cell and to what extent and in what manner the evaluation work of state forestry schemes is proposed to be carried out are vital matters which can be discussed usefully. It seems advisable to include in their purview the work of evaluation of the Central Schemes also.

Similarly in the State Schemes there is a proposal for establishment of a "Statistical Cell" each in the office of every Chief Conservator of Forests. A Forest Range should be the base unit for

which statistical data is initially collected and these would form the basis for Divisions', Circles' and States' figures.

With all the emphasis duly laid on the need for an intensive effort to collect forest statistics, it can be expected that there will not be any difficulty in the materialisation of the proposed allocations. But at the same time, all efforts must be made to ensure that the allocations are most profitably utilized by proper planning. This conference has provided a timely atmosphere for valuable discussions on planning for 'Forest Statistics'. Here are some suggestions for open discussion.

Some Suggestions for Consideration : If the nation is to derive the benefits of the laudable objectives of forestry through purposeful planning, there is much preliminary work which needs to be carried out in different quarters. Similarly, there are some important aspects which need to be settled before the organizations proposed above, both at the state level as well as the national level could function effectively. Looking at the contents of the present meagre statistical tables also, one will observe a large scope for improvement in them.

A few observations could be made on the available statistics.

The F.A.O. publication has laid much stress on the 'International trade'. India figures only as an importer, even though she is an exporter of minor forest products etc., a category not covered by this publication. As regards the production statistics, it has to be based mostly on guesses because production has not been classified on the said basis at the forest levels.

As stated above, the most important publication, viz., Indian Forest Statistics, has been discontinued. But presuming that the publication will be resumed, it can be said that :

- (i) information on areas by altitudinal zones, by gradients and by densities of protective or productive stocking are found to be of great use ;
- (ii) areas under regeneration and plantations should give a species-wise distribution ;
- (iii) classification of staff expenditure can be made on functional basis—protection, improvement, maintenance, plantations, and so on along with figures of expenditure per unit area for different patterns of management ;

- (iv) figures of exports and imports are found to contain values of many commodities with which forestry has had no concern. An exhaustive effort is needed to classify the commodities by the number of stages in which forest products have undergone processing after leaving the forest. It seems to be a difficult task to prepare a list of commodities which can be termed as forest products and their derivatives;
- (v) number of breaches of forest rules are of no use. Quantities and values involved is of more relevance.

Forest range as a basic level: In the document of the Planning Commission outlay of Rs. 50 lakhs (Rs. 5 lakhs for the Union Ministry and Rs. 45 lakhs for the States), has been proposed for the establishment of statistical-cells. But it appears that all the proposed staff will be placed at the disposal of and in the offices of the Inspector-General of the Forests or of the Chief Conservator of Forests of the respective states.

If the ground level, *i.e.*, the *Range level* which may be compared to a Taluka or tehsil level is not going to be strengthened through this allocation, perhaps not much useful purpose may be served if adequate data with a minimum level of accuracy is not forthcoming from the Range levels. The past time-lag is also required to be covered expeditiously. The work of collection of forest-statistics in a particular manner will have to be made one of the *important* functions of a Forest Ranger and if necessary, some *training* and *incentives* need to be provided.

Nature of statistics : Before the cells start functioning, it will be necessary to ensure the maximum utility and uniformity in respect of the statistics proposed to be collected and published. For example, classification of areas by density of vegetation growth, or by potentiability, or by gradients, are matters of much more significance to a planner, or research worker or even the administrative government than whether an area is classified as reserved forest, protected forest or unclassified forest. Similarly a classification of areas by sizes, classes of holding or blocks of forest is more important than whether an area is in charge of the forest department or Revenue department of the same state Government.

The nature of statistics to be collected will depend upon the objectives and thus in turn upon the present and future functions of statistics.

Discrepancies about the extent of forest areas : The foremost of all the discrepancies is about the description of the forest areas. For avoidance of confusion of ideas, terms like forests, forest areas, areas under forest-management, forest areas in charge of Revenue department or forest departments, forest pastures, productive or protective forests, and so on need to be clearly defined in the publication itself. This does not seem to have been done fully in the case of Indian Forest Statistics. In this reference, it seems appropriate to point out to the Annual Series of Year-book of Forest Products Statistics published by the Food and Agriculture Organization, in which each term is defined—an example worth emulation. Area analysis is needed now to be done on many new types of patterns.

Uniformity in the use of units : Terms like cart-loads of timber, head-loads of firewoods or bundles of bamboos etc. do not make matters clear to all. Some standardization appears necessary. In fact, whether forest products should be described in terms of volume or weight will be a basic issue requiring settlement.

Need for assessment of the accuracy of the data : In the case of production statistics, for example, where the figures are furnished by contractors or the forest labourers' Cooperative Societies, it may be advisable to assess the accuracy of the information received. Similarly, in the matter of statistics pertaining to international trade, it does not give satisfaction merely to read the quantities of teakwood exported or imported if the quality and the size-classes are not given.

Adjustment for territorial changes : State-boundaries have been changing in some cases, from time to time. A need to recalculate and reclassify information to conform to the current territorial units naturally arises. In fact, the extent to which the basic Range level itself is stable or permanent is a question which may be examined. Experience reveals that a regular set of maps showing changes in the administrative units have an important role to play in the compilation of the statistics.

Time lag : This is a problem of general and a wide significance. Incomplete information, may not serve much useful purpose. The methodology and the time schedule need to be carefully prescribed and meticulously followed.

Some additional areas required to be covered : The proposed cells will no doubt look into this problem. However some additional areas for collection of forest statistics are suggested :

- (i) Rural employment in forestry ;
- (ii) Trends in the consumption of forest products and their derivatives in different regions ;
- (iii) Income-elasticity of demand for forest products ;
- (iv) Cost-structures involved in management and harvesting of forest ;
- (v) Exercise of rights and privileges ;
- (vi) Market-wise prices of forest products ;
- (vii) Forest based industries ;
- (viii) Forest products concerned with exports and imports.

Shri V.K. Ramabhadran³ & G.K. Mathur⁴ : *Statistics for Estimation of National Income from Forestry and Logging Sector*

This sector broadly conforms to the major groups 121-122* of the International Standard Industrial Classification. It includes the following activities (a) forestry (planning, replanting and conservation of forests, gathering of uncultivated materials, charcoal burning carried out in the forests, etc.), and (b) logging (felling and rough cutting of trees, hewing or rough shaping of poles, blocks, etc., and transportation of logs upto the permanent lines of transport).

Major Group 121 : Forestry —The operation of timber tracts, forest trees nurseries : planting, replanting and conservation of forests ;

3 & 4 : Central Statistical Organisation, Sardar Patel Bhawan, New Delhi.

*United Nations, International Standard Industrial classification of all economic activities (1968).

gathering of uncultivated materials, such as gums and resins, wild rubber, saps, barks, herbs, wild fruits and flowers, mosses, leaves, needles, reeds and roots; and the concentrating and distilling of sap and charcoal burning when carried on in the forest. Establishments primarily engaged in providing forestry services on a fee or contract basis are included in this group.

Major Group 122 : Logging—logging camps, logging contractors, and loggers primarily engaged in cutting timber and in producing rough, round, hewn or riven forest or wood raw materials. Independent contractors engaged in tracking timber, but who performed no cutting operations are classified in group 7114 (freight transport by road). However, holling and transportation of timber (trucking, rafting, etc.) upto the point of delivery to a transport or manufacturing establishment is included in this group. Logging and woods operation conducted in combination with saw mills, pulp mills, or other converting establishments which cannot be separately reported, are classified in group 3311 (saw mills, planing and other wood mills), group 3411 (manufacture of pulp, paper, and paper board) or group 3511 (manufacture of basic industrial chemicals), respectively.

Area Statistics : The Statistics of area managed by the State Forest Departments are generally covered fully, while those under the ownership rights of corporate bodies, civil authorities and private individuals are not. The position in this regard prevailing during different years is set out in table 1.

TABLE 1

Classification of Area under Forests ('000 Sq. Kilometres)

	1949-50	1954-55	1959-60	1962-63
1. Total Forest Area	688.8	724.4	694.4	744.2
2. Ownership				
(i) Forest Deptt.	511.3	598.4	627.6	683.4
(ii) Civil Authorities	20.3	101.6	27.5	22.1
(iii) Corporate Bodies	2.2	0.6	22.8	24.4
(iv) Private Individuals	154.9	23.8	16.5	14.3

Source : Directorate of Economics and Statistics, Ministry of Food, Agriculture, Community Development and Cooperation,

It can be seen from this table that the ownership pattern has undergone a significant change from 1949-50 onwards. The proportion of forest area under corporate bodies and private individuals to total forest area has decreased from 22·8 per cent in 1949-50 to 5·2 per cent in 1962-63. This is in consequence of the National Forest Policy, announced in May 1952, whereafter sizeable portions of privately owned forests were acquired by State Governments through legislation. The change in ownership pattern has resulted in increased reporting of production.

Production : The production data given in the IFSt, even in respect of reported areas represent only the authorised exploited forest resources and do not take account of the unauthorised removal of forest products, whose magnitude is quite considerable. Thus all unauthorised removals of industrial or fuel wood are missed from official production data.

Recently two ad-hoc publications, namely Timber Trends Survey (TTS) and Timber Trend and Prospects in India (TTP) have been brought out by the Ministry of Food and Agriculture. The first one is based on an extensive study undertaken by the Inspector General of Forests on behalf of the FAO. The second one has been compiled by Forest Research Institute, Dehra Dun in compliance with the request of the Asia Pacific Forestry Commission Authorities. Attempts have been made in these reports to arrive at the estimates of unrecorded production and unauthorised removal of industrial and fuel wood. Private forests and to some extent unreserved forests and trees outside forest, e.g., farmyards, village commons, field ridges, canal banks, roadside avenues, individual household courtyards and unproductive fruit trees form the main sources of unrecorded production. In regard to unrecorded production and unauthorised removal, both these reports state there is but limited scope for direct data and in most cases particulars of this part of production have been filled in only as the figures were necessary to balance production and consumption. The approach adopted for these estimates has been from consumption side by end-uses of forest products, the relevant data having been obtained from a variety of sources. Numerous references to industrial users of round wood and its products and the specialised agencies of government in connection with such industries, enabled data to be assembled with a reasonable degree of accuracy. State Forest Authorities also furnished some information in this regard. For further details of non-industrial consumption, relevant particulars

from such sources as the National Sample Survey, Planning Commission, etc., were availed of. To fill in any gaps still left, sample surveys and field studies were undertaken by special staff engaged specifically for the purpose, e.g., saw milling and timber in use in Delhi area, saw milling and timber in use in Calcutta industrial area, timber in use in the Asansol localities of the coal mining industry as also study of the end-uses of timber in the Kallai and other markets of the South West Coast.

Reliable data in respect of outturn of minor forest products are not available. The collection of data in physical terms in respect of some minor products has already been started but at present their coverage is not adequate.

Prices: The prices on major forest produce are now being collected on a regular basis. Wholesale prices are published in the Statistical supplements to Gazettes of some States as also in certain publications of the State Statistical Bureaus (SSBs). Wholesale prices of certain important varieties of timber and fuel wood are being collected by the DESAg, from the State Chief Conservator of Forests and some of these are published in their annual handbook entitled 'Agriculture in Brief'. Some of the SSBs are also compiling similar data for their respective States.

Method of estimation of national income from forestry and logging: The estimates of net product from this sector are prepared by following the 'value added' approach. First, estimates of physical output of each item of major forest product is obtained. The quantity is then valued at the appropriate price and the value of minor forest products is added. Production costs are then deducted to give the net product from forestry and logging. The all India total of gross value of output is built up by aggregating the State totals. The major products include industrial wood (timber, round wood and match and pulp wood) and fuel wood (fire wood and charcoal wood). The minor products consist of a large number of heterogeneous items such as bamboos, charcoal, sandal wood, lac, wax, bidi leaves, ivory, honey, etc. The price used for evaluation takes into account in addition to price at stump, the costs due to felling, hewing, lopping and topping, etc., and their transportation to the permanent lines of communications. The production costs include material inputs, current expenditure on repairs, maintenance of roads and other assets and other operational costs and allowances for depreciation of fixed assets.

Improved data base for estimation of net product: The basis of the preparation of revised estimates of net national product from forestry and logging is the improved data on area, production and prices. This has resulted in an upward revision of Rs. 56.45 crores in the revised estimates over the conventional estimates for the year 1960-61 as can be seen from table 2. The estimates have been prepared both at current prices as well as at constant (1960-61) prices. The estimates at constant prices have been obtained by revaluing each of the major forest products at 1960-61 prices. In the case of minor forest products the value of output at current prices has been deflated with the help of the specially prepared indices of wholesale prices of major forest products. The estimates at all-India level upto 1966-67 both at current and constant prices are given in tables 3.

TABLE 2

Revised and Conventional Estimates of Net product from forestry and logging, 1960-61

(Rs. in lakhs)

<i>Item</i>	<i>Revised</i>	<i>Conventional</i>
1. Industrial wood		
1.1 quantity (000' cu. met.)	6044	5580
1.2 value	10076	8198
2. fuel wood		
2.1 quantity (000' cu. met.)	12693	12313
2.2 value	3106	2531
3. value of minor forest products	4414	1134
4. new plantations	265	—
5. gross value of output	17861	11863
6. less repairs, maintenance, other operational costs and depreciation	946	593
7. net product	16915	11270

Source : Brochure on Revised Series of National Product for 1960-61 to 1964-65,

TABLE 3
Net product from Forestry and logging

(Rs. crores)							
<i>Item</i>	<i>1960-61</i>	<i>1961-62</i>	<i>1962-63</i>	<i>1963-64</i>	<i>1964-65*</i>	<i>1965-66*</i>	<i>1966-67**</i>
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>At current prices</i>							
(i) gross product	171	196	201	227	256	280	306
(ii) net product	169	194	199	225	254	277	303
<i>At constant (1960-61) prices</i>							
(i) gross product	171	183	183	191	201	211	229
(ii) net product	169	181	181	189	199	209	217

Source : Estimates of National Product (Revised series), 1960-61 to 1966-67.

*preliminary estimate

**quick estimate.

Assumptions made in estimates arising from gaps in statistics:
 Although the improved data base has been used for the preparation of revised estimates of national product from forestry and logging yet a number of gaps exist for which the following assumptions have been made:—

- (i) No information is available on production of forest products with regard to forests owned by private individuals and corporate bodies. For this part the outturn of industrial wood per square mile was assumed to be one third of outturn per square mile of the area for which outturn figures are available. The corresponding figures for fuel was assumed to be two thirds. The assumption involved in this procedure is that the forest areas managed by non-government agencies are exploited to lesser extent relative to forests managed by Government agencies.
- (ii) The available evidence shows that considerable quantities of industrial and fuel wood escape reporting for purposes of the

IFSt. A rough estimate of the extent of under-reporting/illegal removals of major forest products for the year 1957-58 is given in publication 'Timber Trends and Prospects in India'. Accordingly, an allowance of 10 per cent of the value of recorded production has been made to cover all such unrecorded production for major forest products. The total estimated value of recorded and unrecorded production of major forest products as estimated above, roughly works out at four times of the value of (revenue from) major forest product reported in the IFSt. For minor products also the same ratio has been adopted to reported figures to arrive at their economic value. These adjustments for other years have been assumed to be the same as for the year 1957-58. An adjustment has also been made to account for new plantations on the basis of data relating to the expenditure on such plantations contained in the budget documents of the State Governments and Union Territories.

- (iii) The prices that are available relate to different kinds of industrial and fuel wood and contain certain elements of trade and transport margins. The average prices worked out are deflated at a rate of 25 per cent to allow for trade and transport margins implicit in them for the estimation of national income. This adjustment factor has been worked out by comparing the average prices with the cost of production of timber as given in the TTS report. In the absence of similar data on cost of production of fuel wood the same deflationary factor is used for adjusting the average wholesale prices of fuel wood.
- (iv) Information is not available on inputs. The NIC used an overall figure of 5 per cent of value of gross output for various cost deductions. Since no surveys on cost of production or other direct information on this subject was available, the NIC figure of 5 per cent has been retained to arrive at the net product. However, on the basis of the information on the purchase of commodities and services etc. for government forests, gathered from the budget documents of State Governments and Union Territories, this percentage has been split up into (i) the value of repairs, maintenance and other operational costs and (ii) allowance for depreciation in the ratio of 4:1. It has been further, assumed arbitrarily that 75 per cent of the outlay on new plantations is on wages and

salaries and the remaining 25 per cent is on cost of materials. The net product from new plantations is equal to the wages and salaries.

Capital formation in forestry and logging : Capital formation in forestry and logging consists of regeneration of forests, construction of roads, buildings and other fixed assets and purchase of machinery and equipment. No estimates of capital formation in forestry and logging are available at present. The Government expenditure account, however, makes possible an estimate of public sector gross capital formation in the form of regeneration of forests.

Gaps in forest statistics : In spite of the various measures taken so far, a number of gaps still exist in forest statistics considered from the point of view of estimation of net product from forestry and logging and capital formation in this sector. These are :

- (i) Production estimates for forests under private ownership and corporate bodies ;
- (ii) Unrecorded production and unauthorised removal of forest products ;
- (iii) Physical output of minor forest products of economic importance ;
- (iv) Price of forest products at the permanent lines of transport ;
- (v) Expenditure on new plantations in terms of wages and salaries and cost of materials ;
- (vi) Current expenditure on repairs and maintenance and depreciation of fixed assets ; and
- (vii) Capital formation in forestry and logging.

Objective surveys may be conducted by the State for the estimation of yield rates under forests owned by private individuals and corporate bodies. Suitable studies may be undertaken to estimate the unrecorded production and unauthorised removal of forest products. Physical output of important minor forest products are now being collected by some states. Efforts to collect such data for the remaining States may be continued.

In order to fill the gaps in forestry statistics and to improve the quality and range of existing statistics, the working Group on Agricultural Statistics has proposed the setting up of full-fledged statistical units in the forest departments in each state. These statistical units would compile whatever data are already available on various aspects of forestry and are likely to be of use and interest to their departments. These units will also initiate surveys for the collection of such other statistics as are of interest to the departments. Many of the states have already set up statistical cells and the other states are in the process of setting up similar cells. A statistical cell has also been set up at the Centre, which will enable the compilation of the data collected by the Chief Conservator of Forests within a reasonable period.

Shri J.S. Sisodia⁵: *Present Status of Forestry Statistics in M.P.*

In Madhya Pradesh, forest accounts for about 39% of the total geographical area of the State. Over 24% of the country's forest area is in Madhya Pradesh. Forest is the most important item of the non-tax revenue, which contributes 12.91% of the total revenue of the State. Overall extent and percentage of the forest in the State may give a sense of complacency but certainly forests are not rationally distributed.

The need for the reliable forestry statistics hardly needs any emphasis. Accurate and comprehensive forestry statistics provide the basis for useful and valuable analysis like inventory of forest resources, demand studies, demand projection, land use capability analysis, study of harvesting techniques, watershed studies, cost benefit studies etc.

The main stumbling block, when studying the condition of the forest in the state with a view to plan for their betterment, is the almost complete absence of reliable forest statistics. The tables in which data are compiled differ substantially from those adopted by the F.A.O. for the collection of the forest statistics for the world as a whole. The Forest Department do not have information regarding

5. Department of Agriculture Economics, Agriculture College, Indore.‡

the end uses of timber and other forest products. The total area of forest reported by "Revenue Department" and "Forest Department" differ by 27.3 lakh hectares in 1964-65. The Forest area as reported through "Forest Returns" has declined by 0.47% between 1956-57 and 1964-65.

Ministry of Food and Agriculture have suggested to the States measures to reconcile the difference between the two sets of figures of the forest area by relating them to the same coverage and to the same definition. The Explanatory Notes and the instructions issued by the Directorate of Economics and Statistics in 1958, are not exhaustive. They need certain modifications for compiling maximum information. Some sort of field work should be started on sample basis and aerial photography would be more useful for this purpose. "Forest statistical Bureau" should be started and made responsible for the compilation of forest statistics accurately and in extensive manner.

Shri L.C. Sharma⁶ : *Estimated Demand for Raw Material for Paper and Paper-Products during the Fourth Five Year Plan*

Paper in the modern life has assumed so much importance that man can live without food but not paper. Per capita consumption of paper forms the basis of economic development of a country. The consumption of paper and paper product at present about 2 kg is bound to increase to 6 or 7 kg in the next 30 years in India. Due to increase in the standard of living and spread of education, this consumption is considered reasonable even though the world average is 26.7 kg. The paper and paper board industry made a rapid progress in India. There were 17 mills with a capacity of 137,000 tonnes in 1951 which rose to 57 with a capacity of 730,000 tonnes in 1968. A beginning has been made in exporting paper from the country which is likely to go up to 60,000 tonnes in 1969-70 and to 90,000 tonnes by 1973-74. The need of the day is to export and earn foreign exchange for the country's economic development. The production of paper and newsprint is expected to go up to 1,028,000 and 260,000 tonnes respectively by 1973-74.

6. Planning Commission, Yojana Bhawan, New Delhi.

Paper grade pulp from M/s. Central Pulp Mill, Dangs, Gujarat will be utilised by the small units having no pulping facility. It is difficult to determine the demand for rayon grade pulp as it depends on consumer preference between this fibre and other synthetic fibres like nylon, terylene etc. Straw and mill boards industry is likely to utilise its idle capacity and hence no increase in demand is anticipated.

Bamboo has so far been the principal raw material for the manufacture of pulp and paper in this country. About 66.7 per cent of the production is based on bamboo while 18 per cent is wood and rest comes from miscellaneous raw materials like grasses, cereal straws, rags etc. There is a great scope for the conifers to play their role in the development of paper economy of this country. It is important to note that conifers of soft woods are used upto 85 to 90 per cent of the world production while India uses only one percent of them.

Cellulosic raw material requirements for Fourth Plan will be of the order of 2.5 million tonnes. About 120 thousand hectares will be needed for harvesting annually on sustained basis to meet the demand of the paper industry. Planting on such a large scale will need Rs. 90.0 million annually at Rs. 750/- per hectare.

Shri G.S. Negi⁷ : *Sampling Methods in Forest Surveys*

Sample survey methods were found to be useful in timber surveys, bamboo and grass surveys, natural regeneration survey and forest insect and disease surveys. The sample survey designs were adopted for Pre-investment survey of Forest Resources for Inventory work in Northern, Central and Southern zone. Although strip surveys are still followed, stratified line-plot surveys have been suggested for plain and slightly undulating areas as these provide estimates with the same accuracy as strip surveys, at low intensity of sampling and consequently at less cost and time. Topographical surveys are still preferred for hilly areas.

Stratified two-stage sampling, selecting topographical units at random or with probability proportional to size and enumerating a

sub-sample of 1% or 2% of clumps for culms, is suggested for bamboo surveys in hilly and undulating areas. Strip or line-plot surveys within topo units may be suitable for plain and slightly undulating areas. Line-plot surveys with quadrat or line transect are presented for grass surveys.

Quadrat, quarter and wandering quarter methods for regeneration survey need to be tried.

Urgency of investigating suitable sampling techniques for many minor forest products which are in great demand for home consumption and export trade should be stressed.

Periodic surveys of forest insects and diseases as well as wildlife may be attempted.

Shri B.N. Sahu⁸ : *Gaps in Forestry Statistics of India*

For assessing the role of forestry in national economy, for reviewing the impact of national forest policy of 1952, for proper planning of the forest resources and for undertaking useful economics research, adequate and reliable forestry statistics are essential.

Useful forestry statistics are being released in the "Indian Forest Statistics" by the Ministry of Food and Agriculture, Government of India. But a lot of work has to be done by improving the coverage and quality of data released in the report.

The non-availability of adequate and reliable data is the greatest handicap in undertaking studies and reviews in the field of forestry. The latest available report, the "Indian Forest Statistics" is for the year 1957-58. Some data in summary form are also being released in the "Statistical Abstract of the Indian Union", but even in the 1965 report, forest data only up to 1960-61 have been released. For better utility of forestry statistics to Government and other users it is essential that something urgently is done to get rid of abnormal time lag in the publication of this report.

8. Bihar State Electricity Board, Patna.

The divergence in figure pertaining to the total area classified according to legal status, composition, function and ownership leads us nowhere. Because of the change in coverage and nonuniformity in definition of forest area, comparison over time and space is, at times, misleading. Some interesting examples are :

- (i) Inclusion of 12 limitations of data in the classification of total forest area table released in the "Statistical Abstract of the Indian Union."
- (ii) Abnormal increase in employment in forest management and forest industries from 2 to 9 lakhs in 1950-59 to 30 lakhs in 1959-60 and 50 lakhs in 1960-61.

Some data pertaining to area surveyed and expenditure incurred under the caption forest survey operations by the States are released, but more important aspects of survey, e.g., activities of such survey operations are left uncovered. Similarly, a complete inventory of existing resources, viz., stand, road, equipment, labour, etc., would be a more useful class of data for planning the cut from the forest than the expenditure incurred on communication and buildings used for forestry as released by the Ministry of Food and Agriculture, Government of India.

Useful data in money value are available on outturn of minor forest produce. But in the absence of quantity of such produce it would not be possible to ascertain correctly whether the increase or decrease in value is due to increase or decrease in prices per unit or in produce or both. A release of suitable index number of such produce based on constant prices is suggested.

The role of forestry in national economy should not be judged only on the assessable aspect of forestry, rather it should be judged after taking stock of benefits the society is deriving from its influence on : (i) Preservation of soil fertility ; (ii) Conservation of soil moisture ; (iii) Prevention of soil erosion and floods ; (iv) Tempering of climatic conditions ; (v) Controlling the intensity and distribution of rainfall ; and (vi) Assuring recreation facilities to the population.

It is for the statistician to develop some suitable methods for measuring the present inassessible benefits derived from forestry.

At present, there is a lack of sufficient data for assessing the role of forestry separately in rural, urban and individual economy. Attempts may be made to fill up this gap.

A detailed inventory of forest potential and its utilisation is necessary for planning simultaneously the utilisation and plantation of forestry on the precept of lasting rather increasing benefits to the society. A good beginning has been made by the Government of India in collaboration with United Nations' Special Fund and the F.A.O. in undertaking pre-investment survey of forest resources.

Adequate and quality data on forest utilisation, cost-benefit coefficient, resource management, harvesting procedure, etc., are lacking. More studies on these aspects of forestry statistics are suggested.

For forward planning of yield in the prospect of increased forest produce, reliable and adequate data on existing plant requirements of wood-based industries in the country and their future expansion programme are not available. Sustained efforts to cover up this gap are essential.

Quality statistics are also not available to study comparative economics of management of forests under conventional methods and intensive plantation forestry. Some observations made by foresters reveal that the plantation of soft-wood, teak and eucalyptus yields three to five times the produce of conventional forests. This result needs further generalisation before it is advocated for adoption for the country as a whole.

Data on balanced use of land, such as extent of area transferred from agriculture to forests and *vice versa*, and the relative economics of forest plantation over agriculture are not available. It is in practice, especially in plains that only marginal land discarded by agriculturists is often left for forest plantation. In these circumstances, it would be meaningless to talk about the relative economics or utility of agriculture over forestry. However, some fruitful studies can be made on restricted area on experimental basis.

Finally, over 16 years have passed since the inception of the National Forest Policy of 1952, and during this period the country

has passed through many ups and downs. We have faced unprecedented droughts, floods, problems arising out of explosive rise in population, three naked aggressions by Pakistan and China, etc., on economic, social, national and defence fronts. In this changed situation and particularly foreseeing the vital role of forestry in development of agriculture and industries, it is suggested that the National Forest Policy of 1952 should be reviewed, and its objectives and emphases be so framed as to meet the present requirements as well as our expectation of the foreseeable future. Perhaps laying down of fresh emphases and objectives by constituting the second National Forest Policy will not be enough. For effective and better implementation of Policy it is suggested that forestry should be made a Central subject. If it is difficult to concede to this demand of time on many obvious reasons, then its proper development should be assured by organising the sector under an autonomous body like the Indian Railways.