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Rapporteurs' Reports

RAPPORTEUR'S REPORT ON FORESTRY (INCLUDING SOCIAL FORESTRY) IN THE CONTEXT OF ECONOMIC DEVELOPMENT

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The subject was discussed previously at the All-India Agricultural Economics Conference held at Kanpur in December 1983. The themes on which contributions were invited then were more or less related to the themes suggested in the synopsis for the present Conference. The response from the contributors was not encouraging in 1983, as only 21 papers could be accepted for discussion. There is not much improvement in the response even now, as the present report has to be based only on 28 papers.

There is, however, a distinct change in the emphasis on selection of themes from the synopsis by the paper-writers. Whereas a majority of the papers in 1983 dealt with the trends in area, production and productivity of forests and the estimation of the demand for and supply of forest products, only eight papers have now dealt with these two themes and the remaining 20 papers have dealt with the other themes, with greater emphasis on themes related to Social Forestry. We shall take note of the discussions in 1983 to avoid repetition of discussion on the same issues.

Nine themes were identified in the synopsis for the subject while inviting contributions for the present Conference. Contributors have ignored two of the themes, *viz.*, National Forest Policy and jhum cultivation. Among the other seven themes, three papers have dealt with temporal and spatial changes in area, production and productivity of forests and their determinants and five papers with the estimation of demand for and supply of main forest products. Fifteen of the papers are directly concerned with social forestry plantations, with five papers each dealing with economic analysis of afforestation of wastelands, economic assessment of agro-forestry programmes, and relative economics of trees and agricultural crops. Only two papers have dealt with processing and marketing of forest products and three, either directly or indirectly, with forestry and the rural poor. Though the papers have been grouped in the above manner, there is an overlapping in coverage to some extent in papers on specific themes. Papers under each of these themes are discussed in the next seven sections and the issues emerging from the discussions are noted in the last section.

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I

TEMPORAL AND SPATIAL CHANGES IN AREA, PRODUCTION AND PRODUCTIVITY OF FORESTS AND THEIR DETERMINANTS

Each paper under the theme deals with a single State and the three papers together cover Andhra Pradesh, Bihar and Orissa. Only in one paper, the author has briefly analysed the inter-State variations in the area under forests and the inter-State disparities in the area in relation to the population. One of the authors has used the Landsat data which focuses attention on the disparities between the data available from the remote sensing system and the conventional data through manned surveys.

V. T. Raj *et al.* have examined the trends in the area under forests in Andhra Pradesh, the pattern of degradation of the forests into non-forest areas and the distributional pattern of forests over the districts. They have employed the data published in the Statistical Abstracts of Andhra Pradesh for the period 1970-71 to 1984-85 and the Landsat data computed from the forest maps of Andhra Pradesh for two points of time, *viz.*, 1972-75 and 1980-82. They find that the actual area under forests in the State is much smaller when viewed from the satellite imageries and that the rate of decline is also much greater. Further, districts showing even a small positive increasing trend in the forest area on the basis of the Statistical Abstracts, appear to be those having a heavy declining trend in their area as per the Landsat data. Their paper thus points out the need to co-ordinate the two sources of data. They have further observed through the satellite imageries that the closed forests have become degraded owing to various reasons and no attention being paid during the stage of degradation, the degraded forests have merged into non-forest lands. Their analysis of the distributional pattern of forests using the Sen's poverty measure assumes an ideal of bringing one-third of the land under forests in each district, and obviously in the State, which has no rational basis. They have come out with a number of suggestions relating to decline in the forest area, the degradation of forests and the delineation of zones based on ecological and economic considerations.

The paper by Hem Chandra Lal Das examines the inter-State and the inter-district disparities in the distribution of forest area and also the trends in forest area, revenue and expenditures in Bihar over the period 1957-58 to 1984-85, more or less on the lines of his paper submitted for the Conference in 1983. Time-series data being not available on the physical output of forests, he has used the revenue figures to indicate the production and productivity of forests after deflating the figures on 1957-58 prices. He has not stated the type and source of price data used for the deflation. He observes that the inter-district disparity in the distribution of forest wealth in the State is increasing from all angles and that there is a continuous declining trend in the area under forests but an increasing trend in the revenue received from the sale of forest products. He believes that indiscriminate felling of trees by the

contractors, over-exploitation of forests, and the distribution of forest land among the tribals are the major factors for the continuous decline in the area. He has not explained the factors responsible for the increasing trend in the revenue. He suggests that the industrial units be involved in the afforestation drive.

Dibakar Naik *et al.* have examined the growth rates in the area under forests and the forest produce during 1971-72 to 1980-81 in Orissa by using the data collected from the Forest Department. They observe that the total area under forests and the area under the protected forests have declined significantly during the decade whereas the area under reserved forests has remained stagnant. This means that the ten per cent decline in the area of forests during a decade in the State has resulted mainly from the decline in the area under the protected forests. They have not examined the reasons for the decline which has come up mainly and suddenly after 1978-79. Since they have used only a short-term series and the decline having come at the end of the series, it should be obvious that their analysis of the growth of forest produce reveal no significant trend in the growth, except for bamboo and cane.

II

ESTIMATION OF DEMAND FOR AND SUPPLY OF MAIN FOREST PRODUCTS

Of the five papers on the theme, two papers have examined the problem of the gap between the demand for and supply of forest products at the national level, two papers have dealt with the problem at the State level whereas in one paper, an attempt has been made to note the economic dependence of the rural households on the forest produce.

Amar S. Guleria has examined the production and consumption of wood products in India over the period 1962 to 1983 by using the data available from published and unpublished reports of FAO. Further, with the help of trend equations, he has estimated the requirement for different wood products by 2000 A. D. and attempted to indicate the gap between the average annual production from 1962 to 1983 and the estimated requirements by the end of the century. This does not indicate the real gap by the turn of the century. He asserts that the strategic aspects of the present forest policy do not indicate sufficient scope for bridging the gap. He hopes that strong policy measures linked up with land reform can bring additional land under plantation. He feels that large farmers in general and industrialists in particular appropriate the benefits of commercial forestry and a majority of the poor remain deprived not only of food but also of fuel and timber.

R. K. Khatkar *et al.* have made an attempt to project the demand and supply for the various forest products in the country by using the compound growth rate functions and the transcendental production function on exactly the same lines as Khatkar with some others had attempted in a paper for the Conference in 1983. The earlier exercise based on the data from FAO Year

Books for 1968-1979 has been repeated with additional data for another five years. The analysis still suffers from the non-inclusion of the price variable in the transcendental production function, even after handling a huge amount of data for 22 products. Their analysis reveals that priorities be given to the production of about three or four of the wood products related to pulp, particle boards and panels which in the aggregate account for only a small proportion of the total production of different wood products in the country.

K. Anantha Ram and G. N. Bhati have analysed the requirement of fuelwood and its availability in the arid zone of Rajasthan by employing the secondary data for forest area and population, and the static coefficients available to estimate the demand and supply parameters. Their analysis reveals a wide gap between the availability and the requirement which might narrow down by the turn of the century, as the values of some of the coefficients may vary over time. To bridge the gap, they have suggested a massive programme of plantation of *Prosopis juliflora*, requiring a heavy plan investment in relation to the outlays in the past.

S. C. Tewari and R. Swarup have examined the fuelwood needs for the rural areas in the lower and the higher hills in Himachal Pradesh. They have based their estimations as in the above paper on the coefficients available for the per capita fuelwood consumption in the lower and the higher hills and the dependence of rural people on forests for their fuelwood requirements in each of the two regions. They have also examined the land resource potential available for the man-made plantation programme. They suggest the creation of man-made forests on 'Shamlat', waste and pasture lands side by side with annual crops on the farms, to meet the energy needs of the rural population.

J. P. Singh *et al.* have examined the linkages between forests and the village households through a field study of five villages in Cuttack district of Orissa. They have examined the utilisation of forest products by the villagers for fuel, construction, agriculture and cottage industries, and observed that their dependence upon the forests for fuel is of a much higher order than their dependence for the other purposes. They find that despite the high dependence, only a small proportion of the households reciprocate in contributing to the resource in the form of planting of trees and participation in the plantation programmes. They suggest framing of suitable policies to create people's awareness in the reciprocation.

III

ECONOMIC ANALYSIS OF AFFORESTATION OF WASTELANDS

Of the five papers relating to the theme, four deal with an economic analysis of plantation of various species on wastelands in the different States, and in the fifth paper an attempt is made to estimate the likely generation of employment through a massive wasteland plantation programme. The term economic analysis has been used by some paper-writers to mean the financial

analysis over a period of time whereas some others have used it to indicate only the net return over time, involving no rate of discount. None of the papers has attempted to evaluate the intangible benefits arising from the wasteland plantation programmes. These comments about the use of inappropriate techniques hold good also for some papers contributed on the later themes.

Dinesh K. Marothia has examined the financial feasibility of plantations of three species taken up on bhata soils of Madhya Pradesh. On the basis of his analysis, he concludes that the plantations of each of the species are financially viable at reasonable rates of discount. To utilise the bhata soils, he suggests the preparation of an inventory of bhata land resources, conducting socio-economic studies of villages for successful implementation of their afforestation and site-specific research work to find out suitable species for different sites.

From a study of a number of old and new plantations in a district of Tamil Nadu, S. Iyyampillai also concludes that social forestry has yielded an economically reasonable level of return. His analysis, however, does not appear to be logical as it is based only on the net return per hectare per harvest, ignoring the period involved. He has also examined the problems in the implementation of the social forestry programme and he feels that some of the failures in the implementation of the programme are the results of inadequate cooperation not only from the implementing authorities but also from the local people.

Rakesh Sharma has attempted a study of woodlots on village common lands in three districts of Rajasthan. His exercise is based on estimated costs and expected returns worked out after a detailed survey to assess the survival of seedlings on the woodlots. He observes that the woodlots may turn out to be financially non-viable units for the village panchayats, as the bulk of them show negative returns. His field observations indicate that the people are not being involved in the decision-making process for the woodlot programme.

D. S. Shukla *et al.* have attempted a cost-benefit analysis of planting of eucalyptus in Kanpur area of Uttar Pradesh. Their analysis which is based on the data from the Forest Department reveals a very high net return of more than Rs. 3 lakhs per hectare from eucalyptus in the area at the end of the eighth year. They argue that it is because of the waiting period of eight years to get the return from the crop that inhibits the farmers from sparing land for its cultivation. They suggest the planting of eucalyptus on Panchayat lands to avail the Panchayats of a handsome income for financing the development of their villages.

Rohit Shukla has stressed the need for carefully managing issues like employment generation and rural development resulting from massive wasteland plantation programmes, involving heavy investment. He has estimated Statewise and yearwise likely employment generation potential of the programme and the availability of labour for the purpose. From his analysis which is in the form of an illustration, he observes that at the end of the fifth

year, only six States in the country would be in a position to achieve full coverage of wastelands under the constraint of the available labour. According to him, funds should not be a constraint for the purpose but the major problem would be one of careful planning, involving full employment and fuller utilisation of wastelands, which has many powerful linkages in the rural economy.

IV

ECONOMIC ASSESSMENT OF AGRO-FORESTRY PROGRAMME AND INSTITUTIONAL STRUCTURES FOR INVOLVING PEOPLE IN SOCIAL FORESTRY

Of the five papers on this broad theme outlined in the synopsis, two deal with the planting of eucalyptus by the farmers in Punjab and one paper examines the factors determining the adoption of farm forestry. One paper has suggested a model in the management of eucalyptus farming and the last paper gives an account of the Van Panchayats in the U. P. hills. Two papers grouped under the theme have also raised issues on the relative economics of trees and agricultural crops which comes under a later theme.

I. S. Chatha *et al.* have examined the production and marketing pattern for eucalyptus plantations for a sample of farmers in eight districts in Punjab. Using the average net return per annum as a measure of profitability which is not logical, they observe that trees planted in blocks do not give adequate returns to compete with the seasonal crops. As the plantations of field boundaries show quick growth and yield better returns, they suggest that these be encouraged in the area and the block plantations be restricted only to the marginal lands. Their results for the block plantations are, however, based on a sub-sample of only four farmers who had harvested their crop at a very early age. A perusal of their cost data also shows that these farmers had to incur very high costs over marketing.

A similar study by Nirmal Singh *et al.* in one of the eight districts in Punjab, gives contrasting results. They have attempted a financial analysis of the cost and returns data for a sample of 42 farmers who had planted eucalyptus as a regular field crop, and commenced harvesting of their crop after the eighth year and completed it by the sixteenth year. They have not noted the marketing costs for the plantations nor mentioned if the produce was sold to the pre-harvest contractors. They observe from the net present value, benefit-cost ratio and the internal rate of return that raising of eucalyptus is quite beneficial to the farmers and that the internal rate of return is the highest for the low density plantations. From the average annuity value, they observe that eucalyptus can compete with the common crops grown on similar type of land. Rotation age, density and inappropriate method of appraisal may be the reasons for the contrasting results from the two papers for the same area.

J. K. Rawat has presented a model in his paper to help in the solution of problems of rotation age and density arising in the above two papers. His exercise on the model is based on the spacing trials for hybrid eucalyptus in

the Terai region and it attempts to determine the most economic combination of initial density and rotation age for the species. He observes that for reasonable levels of discount of 12 to 15 per cent, the optimal rotation is more than ten years. He is, however, aware of the limitations of data in his model. He suggests that such models be worked out for all important agro-forestry species to help the farmers.

In their paper based on a study of three villages in a district in Haryana, A. K. Agnihotri and P. K. Joshi observe that the use of non-conventional forms of fuel goes up with the increase in the farm size, and that farm forestry is needed to meet the fuel requirement of mainly the small and the marginal farmers. Their study shows that farm size and income from livestock determine the size of farm forestry and the farmers prefer to plant trees on bunds. They suggest that the farmers be trained in the management of forestry.

Vishwa Ballabh and Katar Singh have given in their paper a detailed account of four Van Panchayats in the Uttar Pradesh hills. They point out the key elements in the management of forests by these Panchayats, which include a strong need for forest-based resources, relatively small homogeneous groups and provision of penal action in their rules. They doubt if the model could be applied in the plains of the country, particularly in Social Forestry Programmes.

V

RELATIVE ECONOMICS OF TREES AND AGRICULTURAL CROPS

Of the five papers on the theme, four papers have examined the relative economics of trees and agricultural crops and the fifth paper has in addition examined the loss in food production and employment. The results from their studies differ according to the method of analysis, tree species selected, type of land and regional characteristics.

Har Swarup Singh, in his study of sample farms from five districts in Haryana observes that the benefit-cost ratio as well as the average annual benefits are greater for the plantations of eucalyptus, poplar and acasia than for most of the crop rotations on similar type of land. The farmers still prefer to grow the agricultural crops because of the large gestation period for the tree crops. He, therefore, advocates the planting of trees along field boundaries.

In another paper based on a study of sample farmers in one district of Haryana, M. K. Chaudhary and D. R. Aneja observe that the net returns from eucalyptus over a period of eight years are low when compared to the net returns from crop farming over the same period. The comparability is hampered because of undiscounted cash flows unlike in the former paper. The rotation age is identical in both the studies but a specific mention has been made of the lower girth and the lower level of prices as an explanation for the lower returns in the paper under consideration.

Rm. Palaniappan and V. Chockalingam have compared the internal rate of return for babul plantations and millets for a sample of farmers in one district of Tamil Nadu. For a logical comparison, they have assumed cultivation of millet year after year over a period of ten years, which is the rotation age for babul. Their results indicate that the internal rate of return is much higher for babul than for millets grown on the inferior soils.

L. Ratha Krishnan has compared the annual returns from the short rotation tree crop of casuarina with other agricultural crops in Pondicherry, *viz.*, sugarcane, paddy, groundnut, gingelly, etc. His findings indicate that the returns from casuarina, even when it is grown in combination with the inter-crops, are lower than the returns from the agricultural crops. The area under casuarina is yet expanding at the cost of the agricultural crops because of scarcity of water and labour.

A. G. Prasad has based his study on a sample of farmers in two districts of Andhra Pradesh to examine the impact of social forestry on food, employment and incomes. The results of his study indicate that a major proportion of the land devoted to social forestry comes from the previously cropped area and it causes a loss of 489 kg. of foodgrains and 47 man-days per acre. However, there is no loss of income but a net gain of Rs. 4,117 per acre per annum on account of the shifting from the agricultural crop to the tree crop. He has, however, not discounted, but merely averaged the net returns over the period of rotation to arrive at the annual net returns for the comparison.

VI

PROCESSING AND MARKETING OF FOREST PRODUCTS

Only two papers are contributed on the theme, one dealing with the marketing of eucalyptus in Uttar Pradesh and the other with Cuddapah almond in Madhya Pradesh.

Kuldip Singh and G. S. Gill have attempted a detailed study of marketing channels, costs and margins, and the price spread in the consumer's rupee for eucalyptus grown in the Terai region of Uttar Pradesh. They observe that the farmers prefer to sell their produce to the pre-harvest contractor, though they can receive a better price when they take up post-harvest sales. Direct sales for the brick kilns fetches them the maximum price. The large number of channels gives an impression that the market is highly disorganised.

P. K. Mishra *et al.* have studied the marketing channels and margins, and the price spread in the consumer's rupee for the Cuddapah almond in one district of Madhya Pradesh. Their presentation in terms of percentages does not allow any guess about the returns to collector-producers per kg. of the commodity or for work for a day. They suggest that the Government policy imposing restrictions on the marketing of the forest produce has to be changed but they neither spell out the policy nor indicate the direction of the change required.

VII

FORESTRY AND THE RURAL POOR

Of the three papers grouped under the theme, one examines the impact of a social forestry scheme on the rural poor, the other discusses how social forestry can benefit the landless and the poor, and the third examines the constraints in lac cultivation practised by the tribals.

K. Dhanasekaran and K. A. Thangarajan have examined the impact of a tree cultivation programme for the small and marginal farmers on the employment and income of the participants in a village in one district of Tamil Nadu. They observe that since these small holders had planted the seedlings obtained free on their field bunds, it could not generate much employment. They have estimated the annual net returns separately for the agricultural crops and the trees grown by the participants. No significant rise in the income on account of plantation of trees was observed. The impact of the scheme appears to have been inconspicuous on the small and marginal farmers in the village.

S. P. Bharadwaj *et al.* have made an attempt to identify the constraints in lac cultivation through a survey of four lac producing villages in Ranchi district of Bihar. They observe that the income of the lac producing tribals is going up due to the rise in the price of lac, but the production is going down on account of some major constraints, *viz.*, non-availability of brood lac, dearth of cash money to invest, adverse climatic conditions, lack of credit, etc. They point out the existence of a large potential for increasing production of lac and hence income of the tribals engaged in its cultivation, but they do not suggest any measures to increase the production.

P. S. Malik has discussed various aspects of the forestry and social forestry programmes in the country in relation to the development of the poor and come out with a number of suggestions in his paper. Emphasising the importance of community action, he reiterates that unanimous action by the community can alone prevent cattle from grazing in the plantations and the community action is likely to give a high priority to the consumption of the forestry produce within the village for the benefit of the poor as against its sale in the urban markets. He suggests that social forestry schemes should be visualised as instruments of all-round rural development, benefiting the landless people through the provision of employment and the planting of fruit trees and trees yielding raw materials for cottage industries, besides trees for fodder and fuel. He feels that the land tenure system needs to be modified to attract the rural poor and the landless to go in for tree planting on the community lands.

VIII

ISSUES FOR DISCUSSION

The discussions at the Conference in 1983 were centred around the following five issues.

1. Policy instruments for increasing area, production and productivity of forests.
2. Conceptual and empirical problems in estimating the demand for and supply of forest products and a minimum information system for forestry sub-sector.
3. Marketing and pricing problems.
4. People's participation in forestry programmes.
5. Consequences of denudation of forests and shifts in land use from agricultural crops to tree crops.

On the basis of the presentations in the papers submitted for the present Conference, the following issues may be suggested.

1. Co-ordination of the Landsat and man-made data on forest area and steps necessary to improve the man-made data base.
2. Policies and measures to prevent the degradation of the existing forests and the merging of the already degraded forests into non-forest lands.
3. Policy instruments to expedite plantation of trees on wastelands and farm lands to bridge the gap between the demand for and supply of forest products.
4. Consequences of massive programmes of plantation on forest lands, community lands and farm lands on the rural economy and measures necessary to counter their ill-effects.
5. Problems of marketing of forest products grown on community lands and farm lands.
6. Institutional/organisational structures and extension measures to evoke people's participation in the plantations on community lands and farm lands.
7. Determination of a minimum area under forests for an ecological zone.
8. Eradication of poverty in the proximity of forests.