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An Evaluation of Some Selected Social Forestry Models Adopted in India

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I

INTRODUCTION

In India, social forestry implies growing trees on private, community, or government non-forest land, primarily for meeting the local community's basic needs of fuelwood, small wood, and fodder and for providing a supplementary source of income to tree growers and the rural poor. Although the practice of growing trees by the Indian farmers is as old as the cultivation of crops, the National Commission on Agriculture in 1976 first articulated the need for government involvement in this activity on a significant scale. Consequently, social forestry projects were started by many of the State Governments in India in the late 1970s and the early 1980s. Later, the National Forest Policy of 1988 also emphasised the role of social forestry as a source of raw materials for forest-based industries.

There exists substantial potential in India for social forestry. It is estimated that some 30 million hectares (mha) of private land and another 80 mha of common land in India are degraded and they are fit for only tree plantation. The common lands are owned by the State Governments and village panchayats (VPs). Under a variety of social welfare programmes, many State Governments are now granting government wastelands to the rural poor or Tree Growers' Co-operative Societies (TGCS) on long-term lease for tree growing. Thus some 110 mha of lands are available and suitable for farm forestry in India.

On the demand side also, there exists a huge unfulfilled demand for various farm forestry products, especially fuelwood, fodder and timber. In the year, 1987, the consumption of fuelwood and timber in India was 23.5 million cubic metres (M m^3) and 40 M m^3 respectively against the availability of 40 M m^3 and 15 M m^3 from the forests (Oka, 1992, p. 345). According to Kaushal and Chimamani (1992, p. 205), if the all-India target of producing 200 M m^3 of wood set by the government is to be achieved by the year 2000, some 500 million seedlings will have to be planted every year in India. This indeed is a Herculean task for any nation to achieve, and especially so without people's involvement.

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To exploit the potential of social forestry that exists in India, provision of technical information, high quality saplings and other production inputs, institutional credit and year-round marketing facilities to tree growers at a fair price are necessary (Singh and Balooni, 1997, p. 33). Over the years, several models of social forestry development have evolved in India.

Depending upon the form of organisation involved in the activity, one could classify the social forestry development models in the following five categories:

(i) The State Forest Departments (SFD) Model;
(ii) The Non-Governmental Organisations (NGO) Model;
(iii) The Tree Growers' Co-operative Societies (TGCS) Model;
(iv) The Private Companies Captive Plantations (PCCP) Model; and
(v) The Individual Proprietors Plantations (IPP) Model.

This paper attempts to describe and evaluate three of the social forestry development models, namely, the State Forest Departments (SFD) model; the Non-Governmental Organisations (NGO) model; and the Tree Growers' Co-operative Societies (TGCS) model. Each model is presented briefly and illustrated through a case study. The evaluation is done using the criteria of efficiency, sustainability, equity, and people's participation. First, a brief presentation of each of the three models is given and then an evaluation of each model is attempted. The paper is mainly based on the research work done by the author and partly on the work done by the other researchers.

II

THE SFD MODEL

The State Forest Departments (SFDs) in India are the most important and resourceful of all the organisations engaged in social forestry. SFDs launched social forestry programmes in the late 1970s and the early 1980s with the objectives of arresting and reversing the depletion of India's forest resources and to meet the biomass needs of the rural poor. The programmes laid special emphasis on community participation. They got a big boost in the early 1980s when several international development and financing agencies started co-financing with SFDs social forestry projects in India. Consequently, during the decade of 1980-1990, some 14 externally aided social forestry projects were underway in as many states of India. The funding agencies included the World Bank, the Food and Agriculture Organization of the United Nations (FAO), the United States Agency for International Development (USAID), the Canadian International Development Agency (CIDA), the Swedish International Development Agency (SIDA), the Overseas Development Administration (ODA), and the Danish International Development Agency (DANIDA). The total external assistance for social forestry projects over the decade, 1980-1990, was about Rs. 10 billion (at Rs. 42 = US $ 1). In addition, a sum of Rs. 34.53 billion was expended on various social forestry projects in India under India's Sixth Five Year Plan (1980-85) and Seventh Five Year

Plan (1985-90) (ICFRE, 1995, p. 53). Thereafter, over the period 1990-91 to 1993-94, a sum of Rs. 29.93 billion was spent by the government and foreign aid worth Rs. 11.45 billion was given by the World Bank, SIDA, European Commission (EC), Overseas Economic Co-operation Fund (OECF), Japan and ODA for the purpose. It is estimated that over the period 1951 to 1993-94, a little over 21 mha of the marginal and wastelands in India had been afforested at the total cost of Rs. 87.22 billion (ICFRE, 1995; Kapoor, 1992).

Typically, a social forestry project has the following four components: (a) Reforestation and rehabilitation of degraded forestlands; (b) Strip plantation on roadsides, along canal banks and railway lines; (c) Community forestry on village and state-owned land; and (d) Farm forestry.

A brief illustration of the SFD model through a case study of the Aslali village woodlot that was established by the Gujarat State Forest Department under its Social Forestry Scheme is presented in Box 1.

BOX 1. THE ASLALI VILLAGE WOODLOT: A CASE STUDY*

Agro-climatically, Aslali is a typical village representative of the semi-arid tropics of western India. The village is situated 14 km south of Ahmedabad city. It has a total geographical area of about 1,277 ha and in 1991, it had a total human population of about 6000 and livestock population of 1,600. The village had all the basic public facilities and amenities like piped drinking water, electricity, post office, schools, telephones etc. On the whole, it is a progressive village.

Aslali was one of the earliest few VPs selected under the VW scheme. The village had 125 ha of community grazing land of which about 10 percent had been encroached and privatised by villagers. The VP initially agreed to provide 13 ha of its *gauchar* for plantation. The first plantation was raised in the year 1974-75 in 13 ha of land. Encouraged by the success of the plantation in the very first year, the VP provided a few ha of its grazing land every year to the FD for plantation and eventually the village ended up having approximately 65 ha of planted forest in its *gauchar*

From 1974-75 to 1977-78, *deshi baval (Acacia nilotica spp. indica), neem (Azadirachta indica), sirus (Albizialebbek), and ganda baval (Prosopisjuliflora)* were the major tree species planted by the FD in the woodlot. From 1978-79 onwards, more and more eucalyptus saplings were planted. The survival rate of the Aslali village plantations varied from 71 percent to I 00 percent over the years. This could be considered as a fairly good performance.

Although a total of 65 ha of *gauchar* was planted in Aslali village in phases over a period of time, only 13 ha of rainfed forest was harvested in the year 1985-86 when this study was conducted. The FD incurred a total expenditure of Rs. 43,197 or Rs.3,323 per ha on the establishment and harvesting of the 13 ha woodlot. The VP expended Rs. 4,449 on part payment of wages of a watchman, Thus, the total cost incurred by both the FD and the VP on the woodlot over the 12year period was Rs. 47,646 or Rs. 3,665 per ha. The total benefits to the VP and villagers from the woodlot over the 12 year period amounted to Rs. 1, 19,850 or Rs. 9,219 per ha. The present value of net benefits from the woodlot over the 12-year period was Rs. 2,00,957 or Rs. 15,458 per ha. The annuity of this sum at the 15 % discount rate was Rs. 37,076 per year. The benefit cost ratio at the 15 % discount rate was 1.73 and the internal rate of return (IRR) was 28.71 %. This shows that the woodlot was financially viable.

Thus the woodlot yielded substantial benefits to the VP and the villagers. There was no revenue accruing from this land to the VP before the woodlot was established and the *gauchar* was suffering from the 'tragedy of the commons'. The FD intervention not only avoided the tragedy of the village *gauchar* but also made it a valuable and dependable source of income to the VP.

Our interviews with a sample of villagers and the then *Sarpanch (President)* of the VP revealed that the FD officials did not try to involve the villagers in establishing the woodlot nor consulted themwhile making decisions about the tree species to be planted in the woodlot. On the basis of the views and opinions expressed by a sample of the FD officials, VP *Sarpanchas* and villagers, it appears to us that neither the VP was willing to take over the management of the VW nor did the FD try to educate and motivate the villagers-and the VP to take it over as per the provisions of the VW scheme.

* Extracted from Singh (1994, pp. 250-270).

Establishment of tree plantations (woodlots) on *village panchayat* (VP) common grazing lands, locally called *gauchar* in Gujarat is an important component of the Social (Community) Forestry Project of the Forest Department (FD) in Gujarat State. In other states of India also, woodlots constitute an integral part of their social forestry programmes. The VP lands, like any other common pool natural resources, suffer from what Hardin (1968) called 'The Tragedy of the Commons'. Government intervention through the FDs has been extensively tried in India as one of the instruments of averting the 'tragedy' of VP grazing lands. Typically, VPs interested in tree plantation set aside a portion of their grazing land and make that land available to the FD for afforestation purposes under the Village Woodlot (VW) Scheme. The main objective of the scheme is to motivate, train, and enable the participating VPs to establish and manage their woodlots on their own so as to meet their fuelwood and fodder requirements and to generate some revenue. Given the poor financial condition and hence the inability of most VPs in the state to establish and protect their VWs, the FD undertook to establish VWs in the state and to meet all their establishment and management costs in the first three years.

Numerous studies have been conducted to evaluate the performance and impact of the government-managed social forestry projects in India (e.g., SIDA, 1987; Behal, 1990; CIDA, 1990; SEARCH INDIA, 1991; USAID, 1990). The studies focus on several aspects of the projects such as community participation, income and employment generation, and asset creation. Generally speaking, the following are the major findings and conclusions of most of the studies (Venkateswaran, 1995, pp. 93-94):

- The approach has been physical target-oriented with very little emphasis on community participation and sociological aspects;
- Forest Department officials have been reluctant to hand over the management of woodlots and other community plantations to village panchayats and forest protection committees, even where such organisations are functional;
- Employment has been the main and most tangible benefit to the people;
- The objective of meeting the biomass needs of the rural poor has remained, by and large, unfulfilled;
- Of all the components of social forestry, farm forestry has been the most popular with big farmers emerging as the main beneficiaries;
- The response of villagers to community forestry has been poor, due partly to small and uncertain benefits and partly to lack of mechanisms for equitable distribution of benefits; and
- Although they are called social forestry projects, beneficiaries view them as government projects as everything is done by the SFDs with very little people's participation.

III

THE NGO MODEL

In India, over the last one decade or so, there has been a tremendous growth in the number of NGOs involved in social forestry projects. It is estimated that at least 500 NGOs are engaged in this activity. The Gujarat State Forest Department is one of the pioneers in India in involving NGOs in social forestry projects. At present, some 54 NGOs in the state are directly or indirectly implementing various social forestry projects. Using a case study of a tribal village in Panchmahals district of the state where an NGO, Sadguru Water and Development Foundation, hereafter termed as Sadguru, has done an exemplary work. Now, we present a brief profile of the NGO and a few salient features of its model of social forestry.

Sadguru is a non-political, non-profit making, secular, non-governmental organisation. Its head office is located at Dahod in Panchmahals district of Gujarat. It is registered under the Bombay Public Charitable Trust Act, 1950, the Societies Registration Act 1860, and the Foreign Contribution (Regulation) Act. It was registered in 1986 under its present name. Sadguru is recognised as class 'A' NGO by the State Governments of Gujarat and Rajasthan for implementing their development and poverty alleviation programmes. It is known for its community-based approach to natural resources management (Singh and Gupta, 1997). The overall mission of Sadguru is to improve the living conditions of rural and tribal people, mainly by the helping them adopt environmentally sound land and water resources management technologies and practices and facilitating the growth of local institutions that support such management systems.

Afforestation activities taken up by Sadguru include (a) farm forestry, i.e., plantation of trees on farmers' fields; (b) community forestry (plantation on village community land); and (c) Joint Forest Management (JFM) activities. JFM includes natural regeneration of trees on degraded forestlands and protection of regenerated forests by local people under certain terms and conditions mutually accepted by the people and the Forest Department. Of all the social forestry activities of the Sadguru, farm forestry is the most important in terms of its coverage and impact.

Tree plantation is done mostly on private waste/inferior land, field bunds, and field strips. Private wastelands have been deliberately chosen by Sadguru to concentrate its afforestation activities for the reason that there is substantial private wasteland available in its project area. *Nilgiri (Eucalyptus hybrid)* is the most preferred tree species chosen by the people along with other tree species. Other major tree species planted by the farmers include bamboo *(Bambusa bambos),* ganda baval *(Prosopis juliflora),* deshi baval *(Acacia nilotica),* ber *(Zizyphus mauritania),* kasid *(Cassia slamea),* guava *(Psidium guajava), and* sevan *(Gmelina arborea).*

The saplings of all the chosen tree species are raised and managed by women in decentralised nurseries in selected villages. During the plantation season, the nursery-

owning women distribute the saplings to the beneficiaries. Training of nursery raisers and supervision of nurseries are done by the Sadguru staff on a regular basis. This results in high rates of survival of saplings in the nurseries. In general, the nursery survival rates have been as high as 95 to 98 per cent. Sadguru provides assistance to tree growers in the form of inputs such as saplings, fertilisers, and pesticides free of cost. In addition, it also provides cash incentive at the rate of Rs. 0.50 per sapling raised by tree growers. By the end of June 1997, about 28,656 beneficiaries and 12,461 ha of land had been covered under this activity and an estimated 30.7 million saplings distributed to the farmers and planted on their lands in 54 villages. Many villages have become self-sufficient in their fuelwood, fodder and timber requirements. Besides, a large number of new houses have been constructed or renovated using timber/wood available from the trees planted under the farm forestry programme in the last 20 years or so. We illustrate this activity through a case study of Shankerpura village (Box 2).

BOX 2. SHANKERPURA: A CASE OF TRANSFORMATION THROUGH TREE PLANTATION*

Shankerpura is a small village of some 215 tribal households in Panchmahals district of Gujarat. The total population of the village is about 1600 and the geographical area about 588 ha. Every household in the village has some land, howsoever small it may be. In 1976, Sadguru commissioned a Lift Irrigation (LI) scheme in the village. The scheme provided irrigation to about 120 ha of land and benefited some 148 families having land in its command area. In addition, 80 households owned private wells of whom 22 were fitted with portable pump sets supplied by Sadguru consequently, the total area under irrigation increased to 260 ha in 1997. Now, all the families have access to irrigation. Many farmers in the village have terraced and levelled their fields making them suitable for irrigation. This was done under the intensive watershed development schemes of both the Government of Gujarat and Sadguru.

As a consequence of all these activities, the village has been completely transformed from a treeless, semi-arid backward one to an agriculturally advanced green oasis over a period of only about 20 years. In 1976, some 260 ha of land in the village was wasteland. By 1997, most of the wasteland had been afforested and brought under cultivation, thanks to the availability of water from the LI scheme and private wells. Area under irrigation increased from zero in 1976 to 260 ha in 1997, number of private wells from 2 to 80, and number of village ponds from I to 4 over the same period of time. The total number of trees in the village in 1976 was only about 100 or so which by 1997 had increased to over 1000,000. A sample survey conducted in the village in October 1993 revealed that tree plantation was a highly profitable activity for farmers in the village with every household owning, on the average, 4700 trees. The average benefit annuity was Rs. 42,815 per ha and the Benefit-Cost ratio at 15 per cent discount rate 4.93. As a result of the increased availability of wood/timber from the trees, some 160 new houses have been constructed using the timber from village plantations worth Rs. 3 million. In addition, it is estimated that the average number of days of employment generated was of the order of 41 per ha per annum. The increase in the area under crop cultivation and tree plantation has generated so much employment that the rate of seasonal migration has come down from 75 per cent in 1976 to about 15 per cent in a normal monsoon year. The number of school going children also increased tremendously and consequently, the literacy rate in the village increased from about 17 per cent in 1981 to about 45 per cent in 1997.

The assured income from trees has served to provide the tree growers an informal insurance against the adverse effects of droughts and other natural calamities. For example, the severe drought that prolonged over three consecutive years, 1985-1997, did not cause as much panic and hardship to people in the village as it did in other villages in the area where people did not have as many trees to fall back on. In a nutshell, this is the story of Shankerpura village that is now being repeated in other tribal villages where Sadguru is working.

* Adapted from Singh and Gupta (1997) and Balooni (1997).

Conroy (1992) studied the impact of farm forestry activity of Sadguru on the livelihoods of tribals in Jhalod taluka of Panchmahals district. He found out that eucalyptus trees were most preferred by people due to their multiple uses and fast growth and that the trees were used for house construction, as fuelwood and for manufacturing of agricultural implements by most of the households. Balooni (1997) conducted four economic evaluation studies of tree plantation projects of NGOs in Gujarat. He found that all the projects were financially viable and generated a lot of employment and other tangible and intangible benefits for local people. Income from trees was used for meeting consumption and investment requirements of the tree growers. Purchase of bullocks, cows and other livestock were among the important uses of the income from farm forestry. Farm forestry had also led to an increase in the fuelwood and fodder availability and thus reduced the drudgery of women and children involved and their energy and time consumed in collecting and carrying the fuelwood and fodder.

Evaluation studies have also revealed that the NGOs could do a better job than the government of motivating and mobilising people for taking up tree plantation activities and of securing the rights of people. They have the advantage of being close to the people and of their employees working with missionary zeal for overall rural development.

IV

THE TGCS MODEL

TGCS are of a relatively recent origin in India. Fadaval Tree Growers' Co-operative Society organised in the mid 1970s in Surat district of Gujarat State is probably the first such society established in India. A bold initiative was taken by the National Dairy Development Board (NDDB) in 1986 to organise TGCS under a pilot project in selected states of India. For this purpose, a national-level co-operative organisation, the National Tree Growers' Co-operative Federation (NTGCF) was established with its headquarters at Anand. It is a co-operative institution registered under the Multi-State Co-operative Societies Act. Thus it is neither a government nor a private organisation. The NTGCF initially selected the five Indian states of Andhra Pradesh, Gujarat, Karnataka, Orissa, and Rajasthan for organising TGCS. Later on, one more state, Uttar Pradesh, was included in the project. By the end of March 1998, the NTGCF had organised 518 TGCS in these six states. The TGCS had altogether 40,237 members and had planted 8,842 ha of government-owned wasteland and 1,879 ha of private wasteland.[1]

The main objectives of TGCS is to enable villagers to grow trees and grasses of suitable species on their own marginal agricultural lands and village degraded revenue lands to meet the local needs of fuelwood, fodder and small wood. The ultimate goal is to improve the socio-economic condition of the members and the quality of local environment (Singh, 1999). Any 11 or more adult persons belonging

to different families can form a TGCS by making an application to the District Registrar of Co-operative Societies. A TGCS is registered under the Co-operative Societies Act. Any person is entitled to be a member of a TGCS if he/she is residing within the area of its operation, has completed 18 years of age, is growing trees and/or grass, has been given a tree-lease, and has agreed in writing to sell his produce only to the TGCS.

The governance structure of a typical TGCS consists of a General Body (GB), a Management Committee (MC), an honorary Chairperson and a paid Secretary. The GB comprises all the members of the TGCS and has the supreme powers conferred on it under the Co-operative Societies Act and Rules and its own byelaws.

The issue of shares and charging entrance fees are the main sources of funds for TGCS. Every member has to buy at least one share of Rs.10 and pay an entrance fee of Re.1. Loans, donations, subsidies, and grants constitute the other major sources of revenue for TGCS. The NTGCF provides a loan of Rs. 458,000 to each TGCS established under its auspices for the initial period of five years for planting trees on 40 ha of village wastelands. The NTGCF, in turn, receives funds and grants from many national and international agencies including the Canadian International Development Agency and Swedish International Development Authority.

The byelaws of the TGCS stipulate that out of the profit earned by the co-operative from the sale of fodder, timber and other tree produce, 25 per cent be transferred to its reserve fund, a certain amount determined in accordance with the Co-operative Societies Act and Rules is set aside for the co-operative education fund, and a sum not exceeding 12 per cent of the paid up share capital is earmarked for payment of dividend to the share holders. Of the balance left after the above statutory deductions, 65 per cent is distributed as bonus to the members in accordance with the value of trees/grass and any other produce sold by the members to or through the society; 5 per cent is set aside for community development work; 10 per cent for bonus to the society's staff, 15 per cent for soil, water and energy conservation and wasteland development fund; and 5 per cent for co-operative propaganda fund.

We now present in Box 3 a case study of a village TGCS in Kheda district of Gujarat.

It is too early to assess the performance and sustainability of the TGCS that have been established under the auspices of the NTGCF. The first few TGCS were set up in 1987. Final harvesting of the main produce of these early TGCS was not done by the time of this study. But on the basis of data on actual costs and intermediate benefits and estimates of final harvest, we found that a typical TGCS can be financially viable over a period of 15 years or so. Singh and Balooni (1997) estimated the average cost of tree plantation for a sample of three TGCS in Kheda district of Gujarat to be Rs. 13,523 per ha at the 1995-96 prices over a period of five years. The costs included the cost of plantation of trees and after-care; cost of land development and soil and water conservation; and overhead costs of the TGCS. The costs incurred in the earlier years (before 1992-93) were compounded at the rate of 10 per cent to

express them at the 1995-96 prices. The benefit-cost ratio at 15 per cent discount rate varied from 4.46 to 5.35 over a period of 16 years on the basis of projected benefits (Balooni, 1997).

BOX 3. THE VATRA TREE GROWERS' CO-OPERATIVE SOCIETY: A CASE STUDY*

Vatra is a medium-sized village in Kheda district of Gujarat. In 1996, it had a total human population of about 3,965 distributed in 566 households. Of the total population, about 63 per cent were farmers, 22 per cent landless labourers, and remaining 15 per cent were engaged in other non-farm activities. The total geographical area of the village is about 722 ha of which about 522 ha (72 per cent) was arable (cultivable) and about 142 ha was *gauchar,* i.e., village common grazing land in 1987. A TGCS was organised in the village by a Spearhead Team of the National Tree Growers' Co-operative Federation (NTGCF) and formally registered on July 20, 1987 under the Multi-State Co-operative Societies Act 1984. As of 1996, the TGCS had 560 members of whom 311 (56 per cent) were landless, 190 (34 per cent) marginal farmers having less than one ha land, and the remaining 59 were small farmers having 1-2 ha land. The TGCS got 40 ha of degraded land from the Revenue Department of the Government of Gujarat on lease for 15 years for tree plantation.

The TGCS planted some 121,745 saplings of 21 different tree species on 40 ha land over the period, 1987-1992. The survival rate was about 89 per cent. The major tree species planted were *ganda baval (Prosopisjuliflora), dash baval (Acacia nilotica indica), and neem (Azadirachta indica). The* saplings were raised by the members in their own nurseries and were sold to the TGCS at the rate of Rs. 0.43 per sapling. Women were given preference by the TGCS for raising saplings.

The total employment generated over the period, 1987-1992, was 11,464 person days of which women accounted for 61 per cent. The average cost of tree plantation was Rs. 9,369 per ha at the 1995-96 prices and the projected net present value of benefits to the members at 15 per cent discount rate and the 1995-96 prices over the 16-year period, 1987-88 - 2002-3, was Rs. 162, 240 per ha. The Benefit-Cost ratio at the 15 per cent discount rate was 5.35 and the Financial Internal Rate of Return 61.95 (Balooni 1997: 240). Thus, the tree plantation was economically and financially viable and benefited the landless labourers and marginal and small farmers who were members of the TGCS. In addition, the TGCS restored the productivity of the degraded land on a sustainable basis, improved the micro climate and empowered its members through education, training, and participation in the management of its affairs (Saxena 1996:57).

*Adapted from Saxena (1996) and Balooni (1997, pp. 190-204).

In most of the situations obtaining in India, the TGCS seems to be most appropriate form of organisation for promoting social forestry as it is member-centred and its primary goal is to serve its members while having a high degree of social responsibility. If the poor people including the landless interested in social forestry are organised in TGCS, they could have access to institutional finance, technical advice and training, managerial support, production inputs, and national and international markets. The TGCS can bargain better than individual tree growers with those to whom they sell their produce and from whom they buy their production inputs.

V

ANALYSIS AND EVALUATION OF THE MODELS

To evaluate the three social forestry models presented in the preceding sections of this paper, the following criteria were used: economic efficiency, sustainability, equity, and people's participation. Economic efficiency in an activity or endeavour is

achieved when the difference between the value of what is produced by a set of resources and the value of the resources used in the production process is at its maximum, or alternatively when the cost of the set of resources utilised to produce any particular quantity of output is at its minimum. Benefit-Cost Ratio (BCR) and Cost-Effectiveness are two commonly used measures of economic efficiency (Singh, 1994, p. 99). Sustainability in this context means maintaining intact in perpetuity the capital (a produced means of production) and natural resources used in the production of tree products. Sustainability could be measured by environmentally adjusted Benefit Cost ratio. By equity, I mean a pattern of distribution of benefits and costs of tree plantations to all stakeholders in proportion to the effort or inputs contributed by each stakeholder. A comparative statement of per cent share in the total benefits from tree plantation and per cent share in the total costs of tree plantation computed for each category of stakeholders is a simple measure of equity. By people's participation, I mean the extent of involvement of local stakeholders in the process of decision-making at all stages of a project. The involvement could be in the form of contribution of labour, or money or both for a common purpose and participation in the meetings convened to discuss matters of common interest. There is no universally acceptable measure of people's participation. One could, however, use a simple frequency distribution table showing the percentages of all stakeholders who attended project meetings and who contributed labour, money, or both to the project or a People's Participation Index as proposed by Singh (1992).

To evaluate the three models, I developed a composite index combining all the four evaluation criteria assigning equal weights to all of them. Each of the four criteria was arbitrarily assigned 25 points and thus the sum of all the points (weights) was equal to 100. The rationale for assigning equal weights to all the four criteria was based on my conviction that in India's current context all the four criteria are equally important. Thus, each model was evaluated on a scale ranging in value from zero to 100. Economic efficiency was evaluated in terms of the BCR. For every one unit in excess of the BCR of 1.00, 15 points were awarded. Since tree plantation is ecologically the most appropriate use of degraded land on a sustainable basis irrespective of whether the trees are planted by a government FD, an NGO or a TGCS, I awarded full 25 points to each model for sustainability. In the absence of any quantitative/objective measures of equity and people's participation, I used my own judgement for awarding points to the models.[2] Table 1 presents the results of this exercise. As shown in the table, the TGCS model scored the highest points (90) followed by the NGO model (80). I would like to sound a note of caution here. This evaluation of three models is based on a very small sample of only three cases and therefore the results cannot be generalised. But, by and large, there seems to be a consensus among Indian national resource economists about this ranking of the three models.

TABLE 1. AN EVALUATION OF THREE SOCIAL FORESTRY DEVELOPMENT MODELS

Type of model	Evaluation criteria				
	Economic efficiency (25)	Sustain-ability (25)	Equity (25)	People's participation (25)	All (100)
(1)	(2)	(3)	(4)	(5)	(6)
1. The SFD model	10	25	10	5	50
2. The NGO model	25	25		15	80
3. The TGCS model	25	25	20	20	90

VI

CONCLUDING REMARKS

With some 110 mha of marginal and degraded lands which are fit only for tree growing, India has a vast potential for social forestry. Launched in the late 1970s, the social forestry programmes in India got a big boost in the 1980s when several international development and financial organisations started co-funding them. Over the years, several social forestry development models have evolved in India. Of the three models of social forestry, the TGCS model holds the highest promise as an instrument of promoting social forestry in India on a sustainable basis and therefore deserves serious attention of the policy makers and planners. TGCS can disseminate technical information to potential tree growers, supply quality saplings, fertilisers and pesticides to them, provide or help secure institutional credit, and arrange for marketing of farm forestry produce at remunerative prices more cost-effectively than any other organisation can. The role of the State Forest Departments should be confined to creating a congenial environment for TGCS to work effectively. In particular, the government should make available to TGCS its wastelands on long-term lease for tree plantation and provide them the requisite technical information and financial support. When villagers and village panchayats cannot utilise and manage their common lands productively, government investment in establishing woodlots on such lands could be an important instrument of averting their tragedy and restoring and improving their productivity. The NGOs and private companies could complement and supplement the social forestry development work of TGCS, if and wherever needed.

NOTES

1. Based on personal communication with E. Theophilus, Managing Director, National Tree Growers' Co-operative Federation Limited, Anand.

2. Singh and Subramaniam (1996) have used a People's Participation Index (PPI) developed by Singh (1992) to determine the extent of people's participation in four selected Tree Growers' Co-operatives in Dhenkenal district of Orissa, India. They found that the value of PPI ranged from 61 to 74 which is considered to be a reasonably good level of participation.

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