



## **SOCIAL FORESTRY NETWORK**



### **HOUSEHOLD FOOD SECURITY, TREE PLANTING AND THE POOR: THE CASE OF GUJARAT**

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I. Introduction

This paper is addressed to two questions:

- a) In what ways does tree planting influence the food needs of poor households and nutrition of vulnerable groups?
- b) What are the institutional and organisation issues involved in ensuring that any special contribution can be enhanced? The focus in particular is on the integration of food consumption and nutrition considerations into tree planting projects rather than their complementarity to supplementary food and nutrition projects that run "alongside" forestry projects.

The observations in this paper are confined to Gujarat.

II. Forestry and Household Food Security

There is a growing recognition that the forestry sector and social forestry programmes in particular can have a considerable impact on food security at national, regional and household levels. The structure has been elaborated by FAO, for example, in terms of its "standard" analytical form of the contribution of a sector to food security supplies through adequacy, stability and access (FAO 1985) and in more detail as follows:

- adequacy of supplies directly through supplementary sources of food found in the forest and indirectly through provision of grazing, fodder and shelter to livestock;

- stability of supplies through maintaining soil fertility, hydrological balance and agricultural productivity and through its overall protection role;
- access to supplies through generation of rural employment and income and of foreign exchange earnings.

This analysis remains more useful at national rather than household level though additional contributions of forestry products at household level are included such as supply of fuelwood for cooking, food preparation and presentation and the provision of many inputs for agricultural production.

Provision of firewood is of particular importance for the food consumption and nutrition of vulnerable groups such as pre-school children in view of its impact on women's time allocation, now recognised as a key factor in child care. Generally women have a far more influential role in the management of time and income and food from their products than is recognised (Fortmann and Rocheleau, 1985). Tree products have an important influence on seasonal food consumption and malnutrition as many products are available at the end of the dry season when other food resources are running low (Chambers and Longhurst, 1986). The range of uses of trees and ways in which food and income can be derived from them is enormous.<sup>2</sup> Trees can be used as assets to raise money to deal with contingencies and even be mortgaged and used to secure loans from banks (Chambers and Leach, 1986). These are some of the means whereby trees can contribute significantly to household food security and are shown in a simple flow diagram in figure 1.

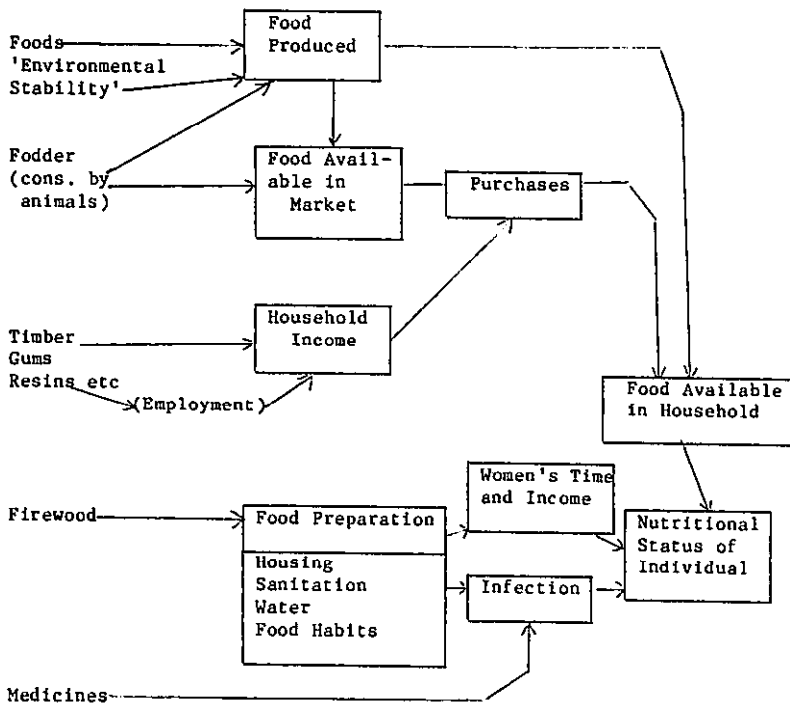
The choice of tree species is crucial in determining the products available; the extent to which the poor and malnourished have access to these food and income products will be directly related to their degree of control over trees. The nature of this control can be determined by the form of project policy: the way in which trees are selected, owned, planted, maintained, harvested and marketed. Trees

do provide food and the wealth of research in India on the nutrition of tribals shows that such groups are very dependent on trees. (In Gujarat the research of Gopaldas et al is typical of this). However, this research has usually gone only as far as looking at the nutrient composition of tree foods. We really have to look at trees and their impact on food consumption and nutrition as cash crops. On the face of it, trees have many of the negative aspects of cash crops that have been raised albeit rather superficially in the literature ie taking more than one cropping season to mature, research, extension and marketing services concentrated on male farmers, concentrated marketing outlets, transfer of land area from food crops with net loss of employment and, in the case of some species, only one marketable product.

On the other hand, careful species choice can reduce some of these aspects leading to a range of products that can be used, by all family members, a flexibility in harvesting time so spreading incomes throughout the year and a complementarity with existing staple food crops. Finally the return per hectare or per man day of labour for some tree species may be so much higher than other crops in some locations that these revenue disparities override any negative effects.

In turning to the Gujarat Social Forestry Project (GSFP) we have in mind how this project could have been organised so that household food security for the malnourished was improved within mainstream project activities and what compensatory nutrition intervention might still be needed.

Figure 1: Tree Products and Household Food Security

Tree Products

Based on: Mason, J B, Minimum Data Needs for Assessing the Nutritional Effects of Agricultural and Rural Development Projects, Nutrition in Agriculture No 4, FAO, Rome, 1983.

### III. The Gujarat Social Forestry Project and Food Problems in the State

The GSFP has been in progress since 1969 with a considerable development since 1980 with the introduction of World Bank funding. It has recently been evaluated under FAO auspices with funding from SIDA (FAO/SIDA, 1985). The GSFP has the following components: strip plantations along roadsides, canal banks and railway lines managed by the Forestry Department (FD); village woodlots (4 ha in size) both FD-managed and self-help; distribution of seedlings for farm forestry; reforestation of degraded forest land by farm families and construction of improved stoves (chulas) and crematoria. The total area covered by the farm forestry is at most 100,000 hectares (Longhurst 1987) with the other components covering nearly 150,000 hectares. Most trees in farm forestry have been planted in blocks or around edges of fields compared to mixed in with crops. Eucalyptus has been the most popular species, being planted by 68% of farmers and comprising about 50% of the other components (FAO/SIDA 1985). The FD has maintained strong control over all their components to the extent that little control of strip plantations is in the hands of local people. The predominant mode of agroforestry has been block planting of Eucalyptus by richer farmers to supply the local pole market. This has been so popular that the price of poles has fallen. Farmers with irrigation facilities have benefitted considerably. Therefore poor local people have received few benefits from the project, although the FAO/SIDA evaluation has shown that smaller farmers are now planting trees in increasing numbers.

How can the GSFP be related to the consumption of food by poor, malnourished people? Figure 1 suggests some of the linkages. Our understanding of these linkages is still rather weak, as is the case generally in production - consumption linkages research. Also what research has been done in the case of tree products has focussed on tribals living in forest communities, especially true in Gujarat;<sup>3</sup> and not strictly part of the GSFP. Food consumption in Gujarat is based on a staple such as bajra, jowar, rice or wheat consumed as chapattis with a gruel, and dahl. Compared to the other nine states surveyed by

the National Nutrition Monitoring Bureau, Gujarat generally finds itself in the middle with regard to adequacy of nutritional standards. Food consumption data shows a below average intake of cereals, average intake of pulses, negligible consumption of leafy vegetables, but above average for milk, fats and oils, sugar and jaggery. Energy intake was 2,327 kcal/consumption unit/day compared with the 10 state average of 2,366 kcal and a requirement of 2,400 kcal. Protein intake was more satisfactory being 67g compared to 62.4g (average) and 55g (requirement); 15.2% of households were deficient in both calorie and protein intakes. The incidence of nutritional problems for children is quite serious with 44% of under-fives being below 75% of the median weight for age.

As important as the levels of food intake and nutritional status are the causes, or associations, as related to socio economic status. The landless had far lower calorie intakes than the landed, over and above land ownership per se, those who raised some crops had higher intake than those who did not. As expected, occupation of the head of the household was also significant. Families where the head was a cultivator had higher intakes than those where the head was a labourer. However, unlike most of the other states, the scheduled tribes were found to consume lower amounts of protein and calories as compared to Harijan families. Possession of cattle was also associated with higher consumption of calories and protein. Data relating income levels of tribal families with malnutrition show no clear trend within the range of 30-100 rupee per capita monthly income. However, a study carried out at the Tribhuvandras Foundation in Anand found that the nutritional status in labourers families was worse than that of non-labourers (Wijga et al 1983).

Clearly if a project is to have an impact on food security at the household level and nutritional status of vulnerable groups, then it must bring income and time benefits (both in terms of quantity and flow), to these poor families (landless in particular) and to women within these families.

The extent to which the impact of the GSFP has been favourable in this regard has to be based on rather partial data. Improved food



consumption of the poor may not have been one of its original explicit objectives but the view should be taken that all types of rural development project should at best improve the welfare of poor groups and at worst not harm them.

In terms of food supply, some land previously cultivated to food crops has been converted to trees, although this is probably no more than 30,000 hectares and unlikely to exert upward pressure on food prices. Because of the predominant choice of species and form of control the project has had little impact on firewood supplies which, so the argument goes, has meant little replacement of cow dung for burning, which would otherwise have been applied to fields. On the other hand, the managed plantations have probably increased fodder availability which have had a positive impact on milk yield. However, the impact on vulnerable groups may have been negative if managed plantations were developed on previously common wastelands and the fodder distribution has now come under the control of a village panchayat. One evaluation carried out by the FD suggested that fodder distribution was reasonably equitable (Verma, 1986). More recent species diversification on the GSFP has introduced more nitrogen fixing trees and provision of fruit through the success of ber.

Remarkably the amount of genuine agroforestry - the mixing of annual crops and tree crops - in the GSFP is small. This will be due to several reasons: the suitability of Eucalyptus, the target population of rich farmers encouraged by the FD, the lack of cooperation between FD and Agriculture Department and the absence of suitable advice on appropriate crop mixtures, and incentives both from farmers and within professional structures to provide these.

The GSFP has not been successful in involving the landless or poor directly. There are several reasons for this but one of the most obvious - if not the most important - is its relentless need to meet high planting targets. This means that there has been little effort to involve such groups as the institutional forms needed require patience and care. The time involved for example in setting up a self-help woodlot of 4 hectares run by 30 landless labourers can be

used to distribute seedlings to several hundred farmers or plant up large areas of road and railway sides. Similarly the GSFP has had relatively little impact on women and therefore of improving their control over incomes. This is out of all proportion to their involvement in the collection, processing and marketing of tree products and the amount of technical knowledge they have on trees. The economic status of women in rural Gujarat society is weak and dependent on male members. The State has a low proportion of women working as main workers (18%) compared to other states.

The difficulty of male extension workers approaching rural women is well recognised, but equally GSFP has made little progress in its aim that initially would have had greatest benefit for women: provision of more firewood. The best firewood species: Acacia nilotica, A. tortilis and Prosopis juliflora make up less than 10% of seedlings distributed to the public. One assumes this would have been much higher if women had been more involved by the Project in agroforestry. The major effort to draw women into the GSFP has been by the Self Employed Women's Association (SEWA) based in Ahmedabad. This has established one village woodlot controlled by women in the village of Ganoshpura, 30 km north of Ahmedabad. Also of benefit to women, smokeless stoves have been introduced via extension agents of SEWA and the FD. According to FD records nearly 48,000 have been introduced.

In rural Gujarati households, women do not have de facto control over assets and resources such that they could significantly influence the welfare of family members. Ownership of trees could be a major means of empowering women.

#### IV. Conclusions and Policy Implications

The major problem in utilising tree crops to enhance household food security in Gujarat as elsewhere is the delay in income flows while the crop comes to harvest; this period is a minimum of 3-4 years. If tree crops have replaced annual crops (or even grazing land) and use any other scarce resource previously devoted to annual crop production such as labour, fertiliser and irrigation water, then there is a net loss to the farmer in this period. Income flows become lumpy and

there is a transition period for which other means of household food security have to be found.

On the other hand, once harvested, returns to tree crops can be high. This represents a major potential for helping the poor. Calculations by the FAO/SIDA evaluation suggest that the rate of return can vary from 19% (Leucaena leucocephala) through 26% (Acacia nilotica) to 37% for Eucalyptus. Estimated returns to village woodlots average at 25%. Precise data on rates of return to annual crops are not available at the current time, but are probably one third to half of them.

Of course agroforestry does have employment benefits although the calculations have not been done to see if these are net benefits compared to previous land uses. Generally it is believed that Eucalyptus leads to a net loss of per hectare labour use. In Gujarat employment in tree care occurs at times when other employment is scarce, especially harvesting in the months of February-March. Some tree species appear to generate more employment than others, although there are no firm quantitative estimates. The trend towards bamboo species (Bambusa and Dendro-calamus) in the GSFP should lead to more "downstream" benefits so generating employment incomes.

Choice of tree species in Gujarat can influence seasonal benefits. Fruits of some species are available in the hungry season (March-June). Bidi leaves for small cigarettes are also available at this period and provide small but crucial amounts of income for local people; oil is collected from Madhuka in April-June.

These observations lead to a first conclusion, or discussion point. What can be achieved in terms of providing benefits for the poor in terms of species choice? The poor may well prefer species with several products; logically they will need species that yield rapidly (such as Eucalyptus!). Related to this point is how the preference for species choice is fed into the decision-making process. Visitors to GSFP are told that farmers keep demanding Eucalyptus despite FD's desire to diversify in response to criticism. But which farmers are these: those with sufficient resources to visit nurseries and transport large quantities of seedlings? A social organisation of a

tree planting project is required that enables the poorer section of the community to influence the species planted and to have control over the product.

The second point or conclusion on integrating food consumption consideration into such a project as GSFP is to ask what supporting activities such as research, extension, input use and target group identification and organisation will maximise the benefits distributed to the poor in such a way as their pressing food "characteristics" (spending 80% of income on food, seasonal shortages etc) are recognised. The poor need to be identified by food and nutrition problems and cause and the question asked: how can tree planting help solve these problems. It may mean providing a range of "non-forestry" inputs such as well digging and irrigation.

The third discussion point in the use of tree technology to improve food security is how to overcome the period of food insecurity while the trees are generating costs but no benefits. Here compensatory programmes are discussed. Several schemes exist in Gujarat to encourage the poor to grow trees in a manner that they receive some interim resources before harvest. The RDFL (Reforestation of Degraded Forest Lands) scheme pays an annual allowance to families of Rs250 per hectare in lieu of income foregone; farmers are encouraged to intercrop trees with food crops so that 2-3 years of food is obtained.

Other project components that might be introduced for this period of food insecurity include:

- the use of food aid both to pay for planting, maintenance and inputs and to replace food lost by tree planting. This approach underlies WFP (World Food Programme) project India 2783 which intends to support forestry development in tribal districts in Gujarat.
- extension and marketing efforts (and coordination with Agriculture Departments) to maximise the benefits from early forestry products such as pasture grass and fruit grafts.

- stipends to provide training in future tree management and establishment of tree product processing facilities.
- direct grants for tree maintenance.
- loans from banks using trees as future assets for collateral.

Finally, the fourth discussion point relates to the way in which ownership and control of the product of their labours can be ensured for the poor. Income flows to poor people who spend 80% of their incomes on food will lead to food consumption benefits. Trees provide means of smoothing seasonal flows caused by annual crops. Tree tenure for the poor, especially on wastelands will be a major area of discussion at this workshop. For food and nutrition benefits to be maximised for vulnerable groups, women must be included in these ownership groups.

#### Footnotes

1. This paper is based on a consultancy carried out for FAO in conjunction with the FAO/SIDA Forestry for Local Community Development Programme, and focussing on the Gujarat Social Forestry Programme. Grateful acknowledgement is given to all those in Rome, New Delhi and Gujarat who helped the authors.
2. Being timber, firewood, poles, fruits, berries, nuts, fodders, gums, resins, dyes, tannins, medicines, wax, honey, insects, saps, soaps, poisons, fibres, bamboos and canes to mention but a few.
3. Surveys have been carried out by Gopaldas among the forest-dwelling Rathwakoli ribs. Protein intakes were adequate but intakes of energy, iron and in particular retinol were deficient. (Gopaldas et al, 1983).

Bibliography

- FAO, 1985, The Role of Forestry in Food Security, Committee on World Food Security, CFS 85/4, Rome.
- Chambers, R and R Longhurst, 1986, Trees, Seasons and the Poor, IDS Bulletin, 17, 3, 44-50.
- Fortmann, L and D Rocheleau, 1985, Women and Agroforestry: Four myths and three case studies, Agroforestry Systems, 2:253-272.
- Chambers, R and M Leach, 1986, Trees to meet contingencies: savings and insurance for the rural poor, IDS Discussion Paper.
- FAO/SIDA, 1985, Evaluation of the Gujarat Social Forestry Programme, Rome.
- Longhurst, R, 1987, The Gujarat Social Forestry Project, Food Security and Nutrition, Report to Food Policy and Nutrition Division, FAO, Rome.
- Gopaldas, T, K Saxena and A Gupta, 1983, Intrafamilial distribution of nutrients in a deep forest-dwelling tribe of Gujarat, India, Ecology of Food and Nutrition, 13, 69-73.
- Wijga, A, U Vyas, V Sharma, N Pandya and D Nabarro, 1983, Feeding, Illness and Nutritional Status of Young Children in Rural Gujarat, Human Nutrition: Clinical Nutrition, 37C, 255-69.
- Verma, D P S, 1986, Who Benefits? A Case Study regarding benefits from Dhanori Village Woodlots, Baroda, mimeo.
- WFP, 1986, Project India 2783: Forestry Development in tribal districts of Gujarat, WFP/CFA 22/8, Rome.

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