

### A popular indigenous strategy for sustaining shifting cultivation

Natural fallows work well in regenerating soil fertility, if the local fallow species' diversity and soil quality have not been degraded. But where the land has been degraded to the point where grasses, particularly *Imperata cylindrica*, dominate the abandoned fields, natural regeneration is no longer as feasible. The result is a grass fallow incapable of regenerating adequate nutrient accumulation, and is very laborious to reopen for cultivation. *Chromolaena odorata* is an important pioneer fallow species that naturally suppresses *Imperata* in the absence of frequent fires. It accumulates much more biomass, and regenerates crop productivity much more efficiently. Shifting cultivators throughout South-east Asia find it a highly desirable fallow species, even compared to secondary or primary forest. *Austroeuatorium inulifolium* (Figure 6) is a similar non-native invasive species common at mid-elevations above 600 m, that has proved very beneficial to farmers practising shifting cultivation in West Sumatra. It spread widely after its introduction in the late 19th century. Farmers found that it reduces by one half the length of the necessary fallow period to regenerate soil fertility.

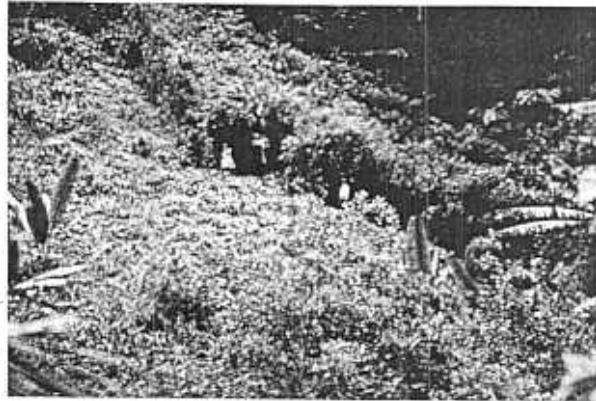


Figure 6.

### Beyond Food Crop Agriculture: The Transition to Agroforests and Farm Forestry

Most parts of the Asian uplands are not suitable for food crops because of their fragile and infertile soils. But they have a strong comparative advantage for agroforestry. Farmers will adopt tree-crop systems when markets are available and they have reasonably secure tenure to their land and trees. State forest departments are gradually realizing that it is crucial to recognize the rights of upland villagers in order to promote sustainable land uses that protect watershed services.

**Agroforests for income and environment.** Farmer-developed agroforests have already evolved on millions of hectares in Asia. Villagers in Indonesia, for example, have created many types of complex agroforest land-use systems. These agroforests are predominantly based on rubber, dipterocarp resin or fruit species. Farmer-evolved agroforests often resemble natural secondary forest systems in structure and ecology (Figure 7). The trees provide food, fuel and cash income. Agroforests are economically important for villagers. In Sumatra, they provide up to 80% of village income and enhance the living standards of the

majority of the households. They produce 80% of the rubber in Indonesia; 95% of some marketed fruits such as durian, duku and nutmeg; 75-80% of the commercially traded dipterocarp resins (*damar*); and a significant proportion of rattans and bamboo. They play a major role in regional economic development by supplying local agro-industries and providing inputs to marketing chains that branch out far beyond the rural areas.

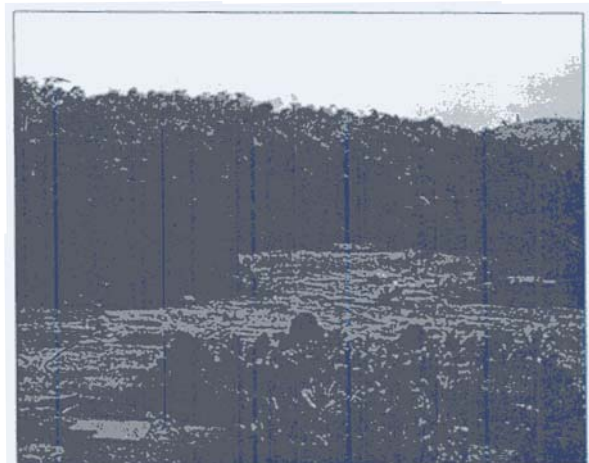


Figure 7.

The agroforest accumulates a carbon stock that in some systems may be maintained indefinitely. They provide a superior alternative to many other land uses in protecting watersheds from soil erosion and flooding risk; they conserve a greater amount of biodiversity; and they provide a greater sustained source of income-generation for local communities than other forms of crop agriculture or tree monocultures. Thus, we find that the objectives of smallholder communities practising such systems are much more compatible with those of national governments in protecting watersheds and biodiversity than had previously been assumed.

The most widespread agroforest system in Indonesia is rubber agroforestry (or 'jungle rubber') which occupies over 2.5 million hectares. In this smallholder system, rubber trees are the main component, but many other species of fruit and timber trees are combined with rubber, either intentionally or through natural regeneration. Biodiversity levels often approach those of natural secondary forest, but the latex yields are low (generally about 500 kg/ha/annum). The most important innovation to increase their productivity is the use of improved rubber germplasm, particularly modern clones. The public sector has encouraged the adoption of estate-type monoculture systems, but these require high levels of investment. Thus, these projects have only reached about 10-15% of the smallholder population during the past 25 years. Recent studies have shown that smallholders can substantially increase their rubber yields and profitability by incorporating new rubber clones into their present jungle rubber or mixed agroforestry systems. New investment is needed in more innovative extension strategies to diffuse these systems to the millions of smallholders who would benefit from them.

#### ***Agroforests and the buffer zones of protected areas.***

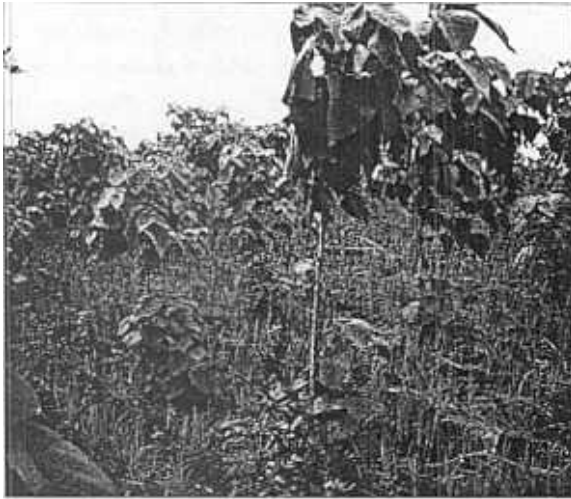
Protected areas are under enormous pressure throughout Asia. Agroforestry land-use practices are favourably suited to the boundary zones of protected areas. Complex agroforests in particular are an attractive model for buffer zone management that provides local livelihood while enhancing the level of biodiversity, often extending natural plant and animal habitats outward from the protected ecosystem into the agricultural landscape.

***Agroforests and land tenure.*** Official recognition of local land and tree tenure systems would underpin their security and enhance the development and expansion of agroforests. Public-sector assistance would further strengthen the trend towards smallholder tree-based land-use systems. Smallholder communities could then contribute substantively to the national production objectives for which the production forests exist. Complex agroforests are one of the most promising solutions to transforming unsustainable slash-and-burn systems. Research and case study experiences are needed as a foundation for policy reform to enable communities to obtain more secure tenure and to make aggregate contributions to the economy. Detailed protocols for developing management agreements between local populations and the national government are essential. The focus needs to be on mechanisms that operate at the community level to provide an appropriate degree of tenurial security while ensuring that the environmental and production objectives of the national government are met.

De Foresta and Michon have emphasized that agroforests are successful only when they meet smallholders' income needs. They note that such a system is usually composed of two sets of commercial tree species suited to local conditions, one set providing regular cash income (e.g. rubber, resin) and the other providing seasonal or irregular cash income. Such composition ensures economic and ecological viability of the forest in the long run, provided that clear tenurial rights on the basic units are recognized. The challenge is to extend systems of this nature to the millions of hectares of the more degraded lands, such as the *Imperata* grasslands that now occupy 35 million hectares in Asian countries.

#### **Smallhold Farmers: The Foresters of the Future**

There is a transformation in forestry occurring in Asia. In most of the countries in the region, the natural primary forest has largely disappeared and during the past decade has no longer been producing adequate quantities of timber to supply even local demand. This is a sad situation, but there is one bright side. A market for farm-grown timber has evolved, which had never existed before, with farm-gate prices many times higher than previously. Upland farmers can now earn money by planting timber trees on their farms.



*Figure 8.*

Generally, they plant their trees along the borders of their fields or in their fields as intercropped with their food crops (Figure 8). As their trees mature in seven to ten years they harvest the timber, often a little at a time, and earn continuous cash income for buying food and the other goods and services they need.

Smallholders, even shifting cultivators on the frontier, are now engaging in farm forestry for the first time in great numbers, in response to recent price incentives. Economic analyses show that timber tree production is often much more profitable than food cropping in the uplands. Tens of thousands of farm families are already engaged in growing trees as crops on their farms in countries such as India, Indonesia, The Philippines, Thailand and Viet Nam. Consequently, there have been major increases in the amounts of farm-grown timber. This dramatically increases the prospect of smallholder timber production systems that rapidly increase tree cover in the landscape. Increasingly, the evidence indicates that smallholders may have some clear advantages over large-scale producers and that, contrary to conventional wisdom, there may be few or no returns to scale in the production of timber trees in the tropics.

Many specialists in tropical forestry and agroforestry now believe that in Asia, generally, the farmer will be the forester of the future. That is, small farmers will be producing timber for local and national markets, and the denuded upland landscapes will gradually be revegetated. The question is, how do we enhance this process? How do we

invest to ensure that farm households have good tree germplasm, better systems of agroforestry tree cultivation and better market infrastructure? There are clear implications for investment in the development of the technology, dissemination processes and the infrastructure that will enhance smallholder tree production systems. Success will create increased employment and enormous environmental benefits in the future.

#### **Environmental Transfer Payments to Upland Farmers: Creative Partnerships Needed**

Upland people have a crucial role to play as stewards of biodiversity and watershed services. It is becoming increasingly evident that investment in upland development may also have positive benefits for the world environment. There is opportunity here for society to support this through environmental transfer payments. These would reward farmers for conserving their environment and sequestering carbon through tree production. Clear and effective mechanisms are needed to enable these win-win possibilities. There are a number of areas where environmental transfer payments may help alleviate key global and national environmental problems, while economically benefiting the upland poor. One particularly significant one is in the area of planting trees for carbon sequestration to alleviate the amount of carbon dioxide in the atmosphere.

Investments in forestry through joint implementation initiatives, and those under discussion with the clean development mechanism, have focused primarily on establishing large-scale plantations and natural forest management. The possibilities for investing in smallholder agroforestry have for the most part been ignored. This is partly because of the problems perceived in certifying and monitoring such systems. Consequently, there is an urgent need to design and test a range of implement mechanisms that focus on small-scale upland farmers. The intention is to test how to implement environmental transfer payment schemes that benefit farmers or national agroforestry programmes. This latter 'programme' approach may include, for example, greater public-sector investment in quality tree germplasm for better productivity, better tree management systems and in market infrastructure that stimulates more tree production.

### Institutional Innovations: Farmer-Led Organizations for Sustainable Agriculture

Watershed degradation does not have to be an inevitable consequence of using land for agriculture or forestry. Smallholders can engage in farming and management of natural forest resources in both a productive and resource-conserving manner. Awareness of this has focused attention on evolving demand-driven, community-based approaches to watershed resource management, in which those who occupy the land actively participate in management and sustainable utilization of their local watershed resources for multiple purposes. Land degradation can only be solved ultimately by the land users. It involves complex interrelated activities. Success depends upon enhancing rural people's inherent abilities to apply and adapt new and indigenous technologies, and to involve and evolve local institutions that manage and conserve resources better.

A look at current prescriptions for more sustainable farming systems in Asian watersheds reveals an enormous variability in conditions and consequently a high degree of technical uncertainty about the effectiveness of the solutions proposed. The problems will not be solved with simple recipes. This is leading to real involvement of rural people in the process of identifying and applying solutions that make sense to them. Often, the issues need to be tackled at a scale bigger than the individual household, cooperatively at the community level.

Much attention has been given to the role of local organizations in forest management and management of other natural resources. This is exemplified by the progress in joint forest management in India, forest users' groups in Nepal, and community-based forest management in The Philippines. But local organizations may also be a means to mobilize knowledge to solve problems in agriculture through improved land husbandry. Particularly in countries where decentralization of power and fiscal responsibility is occurring, and democracy is becoming institutionalized down to the village level, leadership skills in the farming population are maturing. These skills provide a basis for the evolution of organizations led by farmers that address practical ways of overcoming their problems in creating a more sustainable agriculture.

Among the organizational models for enhancing local initiative in attacking land degradation challenges, one of particular interest is called "Landcare". Through this movement, local communities organize to tackle their agricultural problems in partnership with public-sector institutions. The distinguishing characteristics of Landcare groups are that they are voluntary, self-governing, and focus on problem-solving resources within the community. Experience in The Philippines (200 groups) and Australia (4 500 groups) suggests that such an approach may provide a means to more effectively share and generate technical information, spread the adoption of new practices, enhance research, and foster farm and watershed planning processes. These groups exhibit some similar characteristics to the farmer field schools made popular in integrated pest management. Landcare groups, however, are aimed at a broader range of land degradation and sustainability issues. Some distinguishing features of Landcare groups are:

- They develop their own agenda and tackle the range of sustainability issues considered important to the group.
- They tend to be based on neighbourhoods or small sub-watersheds.
- The impetus for formation comes from the community, although explicit support from outside may be obtained.
- The momentum and ownership of the group's programme is with the community.

Farmer-driven approaches show promise of being more effective and less expensive than current transfer-of-technology approaches. In the southern Philippines, farmer organizations became the basis for a successful grass-roots approach to finding new landcare solutions, partnering with local government, pulling in outside technical and financial resources, and diffusing new information throughout the community. The experience suggests that there is major potential for enhancing this grass-roots approach elsewhere in South-east Asia.

There are signs that institutions like these could revolutionize extension systems. Extension agents are transformed from the role of teacher to one of facilitator to whole farmer groups. Conservation-farming based on contour buffer strips was one practice that was popularized

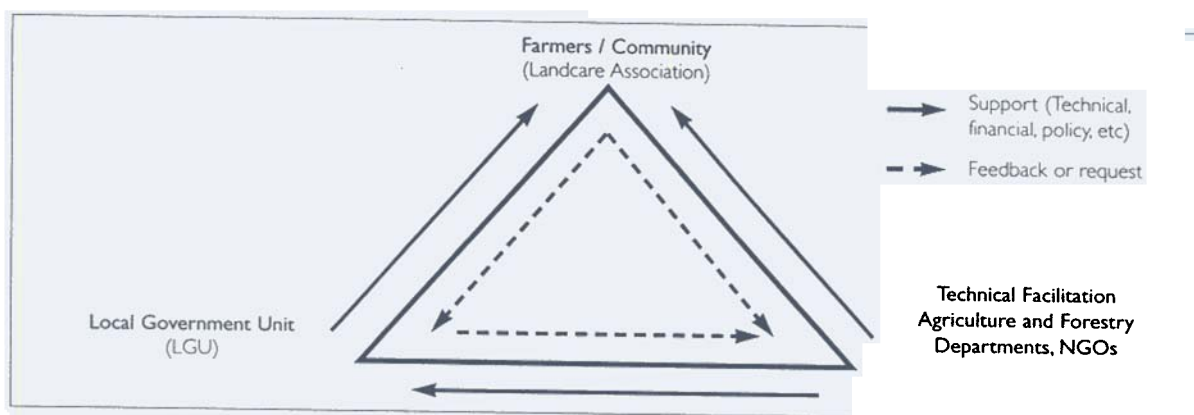


Figure 9: Collaborative Structure of Landcare

through Landcare in The Philippines. Another has been the expansion of nurseries for growing new species of fruit and timber trees to diversify the farm enterprise. As a result of Landcare activities, hundreds of household nurseries have been established by the membership using their own resources, with no outside financial support. Landcare groups have also gained significant influence at the local political level. Local governments are actively and enthusiastically assisting the movement with budgetary allocations and solid political support. The collaborative structure of Landcare is built through these mutually supportive relationships among the farmers' organizations, local government and technical support agencies (Figure 9).

Conditions are evolving to stimulate greater entrepreneurship in the rural areas of Asia. Self-governing, farmer-led knowledge-sharing organizations may play a key role in helping to foster this entrepreneurship, and channelling it into productive opportunities. They may complement local savings and credit groups, and other types of local organizations.

What needs to be done to release the power of the Landcare concept? The public sector and non-government sector can assist in facilitating group formation and networking among groups, enabling them to grow, developing their managerial capabilities and enhancing their ability to capture new information from the outside world. They can also provide leadership training to farmer leaders, helping ensure the sustainability of the organizations. Cost-sharing external assistance can also be provided. The use of trust funds, where farmer groups receive small grants for local projects, should be emphasized.

### Conservation for Business; Business for Conservation

One of the key aspects of the new IFAD programme is the concept of "Conservation for Business". It emphasizes that although we need conservation farming in the uplands, we must go far beyond the implementation of practices that just rehabilitate the environment. We must enable the farmer to make more profit on a sustainable basis. That is fundamental for successful upland environmental rehabilitation in the future. To do this, we have to emphasize market development and non-farm income-generation as key components of new projects.

### Will Investment in the Uplands Pay Off?

The assumption among development investors has always been that the biggest payoff is to be obtained in the lowlands, not in the uplands. The uplands have always been associated with the adjective "marginal", indicating that they are outside the more prosperous farming areas of the economic mainstream. But it is often misunderstood to imply that the uplands are unproductive and thus not worth investing in. Economists have in recent years shifted their views dramatically on this issue. Empirical evidence now available from several studies indicates that investment in the less-favoured uplands may have higher marginal returns than investment in the more favourable areas. Investment in the more favoured areas has been intensive, particularly in irrigated agriculture. And because there has been considerable prior investment in the more favoured areas, further investment there faces diminishing returns. Investment in the uplands has been seriously undercapitalized. Thus, it may produce higher returns to

capital. Therefore, the model emerging favours a more balanced investment profile between the lowlands and the uplands.

This paper has reviewed some of the technical and institutional options that are promising for future upland investment. A flexible lending mechanism for such investments is crucial. Investments in the uplands must cope with diversity and uncertainty. A process approach is much more relevant than a project approach. Investment programmes must start small, adjust iteratively and have long implementation periods. Lessons learned can then be used to make flexible mid-course corrections. Little research for the uplands has so far been funded. Therefore, returns to investment in applied research may also be expected to be very high. If IFAD includes these elements in the framework for its new programme for the Asian poor, then I am confident that it will be one of the more successful agricultural development thrusts of the next decade and will provide a model worthy of emulation by many other institutions.

## PANEL DISCUSSION

### GENDER ISSUES

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The theme of this programme is poverty alleviation in the conventional sense, but more recently they are using the word "securing livelihood." Securing livelihood is a phrase that is more widely accepted and it does not mean simply to increase income but aims to enhance the level of the capabilities of the people. An Indian scholar, Professor Amartya Sen, a Nobel Prize laureate, also suggests this concept of capability.

Alleviation of poverty, securing livelihood: the objective of such is not simply to secure an income above the poverty level but to achieve capabilities and enhance the capabilities of the people. Money will allow people to eat, but livelihood is secured by using money. But securing livelihood is not enough through just mere purchases of goods. Rather, the hidden potential, i.e. the capabilities, should be developed. What can he do and what is he? People have come to agree that we must emphasize those aspects more and more. Nourishment, good health,

shelter, basic education – those primary capabilities are included in the so-called capabilities, but some other capabilities are more complex. Also, in determining social well-being like managing natural resources at household and village levels.

I wish to focus on the distribution of capabilities within a household. Distribution of capabilities within a household is subject to a variety of factors, depending on the way in which income and resources, goods and services are controlled within the household. This control depends on relations of power and hierarchy. You may find it strange that I use the words "power" and "hierarchy" within the household, but if you look at the gender and age relations in such relationships, there is the concept of which incorporates power and hierarchy as well.

Income and resources of a household are not necessarily equally shared and enjoyed by each member. There is not an even or equitable sharing of such resources. Even when the household income per member is above the poverty line, the less advantaged members of a household might live in sheer poverty, and those less advantaged are women, children and the vulnerable aged. So, if you look at the average household, it may be above the poverty line but in reality some of those less advantaged members are in dire poverty without resources. Insufficient food would be a typical example, or they may not have enough time to rest, or do not receive any health care, or are not given the time to care for themselves. They may lack education and they may lack decision-making power regarding natural-resource management.

If you research the issues pertinent to poverty and household economy and income, you would learn that, depending upon whether the household income is controlled by a man or a woman, it would result in different consequences. In other words, the livelihood level of that household may differ. Women tend to spend more of the money they control on children and overall household needs than men do. Therefore, in order to improve the achievement of basic capabilities of the family, it is necessary for a programme to advance women's control over household income.

There are more complex issues related to latent capabilities, but in the interest of time, I shall skip them and look at the gender issue to see what we can do to make