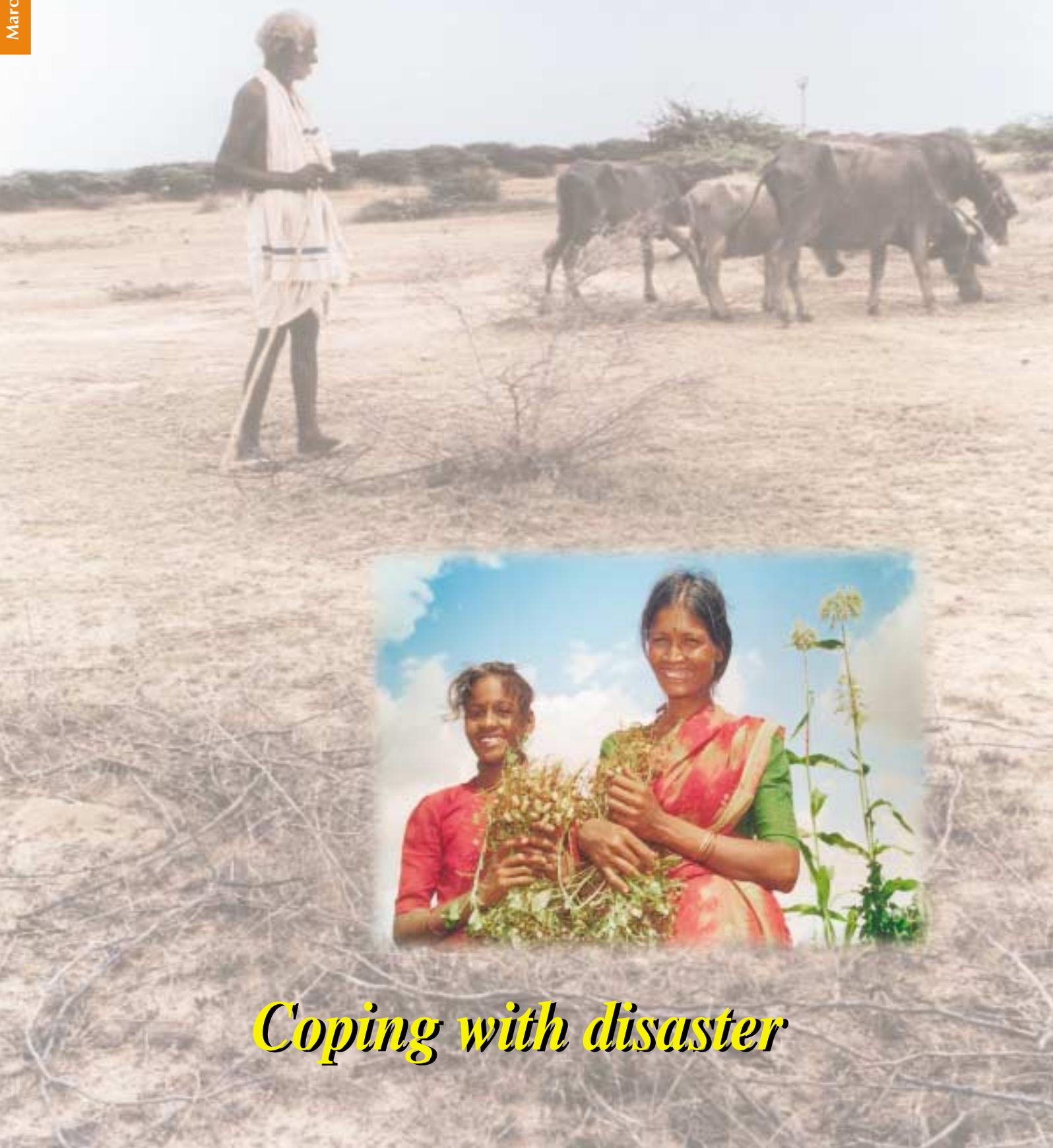


*Including Selections from International Edition*



# LEIS INDIA



***Coping with disaster***

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The editors have taken every care to ensure that the contents of this Newsletter are as accurate as possible. The authors have ultimate responsibility, however, for the content of individual articles.

The editors encourage readers to photocopy and circulate Newsletter articles.

The theme of this issue is 'Coping with disaster'. We focus on the threats to production such as drought, floods, hurricanes, war, HIV/AIDS, etc. and the possible responses to them. The articles show the importance of traditional resilience strategies, site-specific agroecological practices and

# Dear Readers

farmer-led approaches to enhance the resilience of farming, leading to disaster prevention in risk-prone regions. No less important in recreating agricultural production after disaster is that relief and development agencies build on the knowledge, skill, spirit, ingenuity and efforts of the farmers themselves.

In Europe, we are witnessing how the highly industrialised agricultural system has lost its resilience. Swine Fever, dioxin polluted feed and Mad Cow Disease are now being followed by outbreaks of Foot and Mouth Disease, showing clearly how agricultural development can lead to disaster. All of a sudden the sustainability of agriculture is a hot topic of discussion and features prominently in the daily newspapers. There is a lot of consumer pressure for safe food and in some European countries, such as Germany, the politicians have now actively taken a stand for ecological agriculture – at the expense of the hitherto strongly promoted and subsidised industrialised agriculture.

The editors.

## Out of balance? Resilience in farm level food security

Astrid Björnson and Prem Gurung



*Nepalese farmers in risky conditions developed various strategies – technical, economical, social and spiritual – to secure food and health. This resilience capacity is being seriously threatened due to changing conditions, opportunities and needs, which is forcing farmers to develop new strategies. The authors discuss the old and new strategies and point at the responsibility of development professionals in enabling farmers to improve their resilience capacity through location specific participatory action research.*

**ame** promotes sustainable livelihoods through combining indigenous knowledge and innovative technologies for Low-External-Input natural resource management. ame is an innovative training programme and resource centre enhancing synergies between institutions and individuals involved in sustainable agriculture.

**ILEIA** is the Centre for Research and Information on Low-External-Input and Sustainable Agriculture. It seeks to exchange information on LEISA by publishing a quarterly newsletter, bibliographies, and books. ILEIADOC, the data base of ILEIA's documentation centre, is available on diskette and on ILEIA's Homepage: [www.ileia.org](http://www.ileia.org). Back issues of the ILEIA Newsletter are also available on ILEIA's website.

**LEISA** is about Low-External-Input and Sustainable Agriculture. It is about the technical and social options open to farmers who seek to improve productivity and income in an ecologically sound way. LEISA is about the optimal use of local resources and natural processes and, if necessary, the safe and efficient use of external inputs. It is about the empowerment of male and female farmers and the communities who seek to build their future on the bases of their own knowledge, skills, values, culture and institutions. LEISA is also about participatory methodologies to strengthen the capacity of farmers and other actors, to improve agriculture and adapt it to changing needs and conditions. LEISA seeks to combine indigenous and scientific knowledge and to influence policy formulation to create a conducive environment for its further development. LEISA is a concept, an approach and a political message.



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## Measuring farmers agroecological resistance to hurricane Mitch

Eric Holt-Gimenez

*The methodology and findings of an action research effort to measure and compare the impact of hurricane Mitch on conventionally and agroecologically farmed lands in Honduras, Nicaragua and Guatemala are presented. The study clearly shows the advantages of sustainable agriculture and farmer-led approaches. It also uncovers a policy ceiling to development of sustainable agriculture. The author states that it is due time to translate farmer-to-farmer successes on the ground into broad-based public pressure to influence national policy-makers.*

## Survival to Sustainability: Pragathi Mahila Samakhya's case

Y Ramesh and Y D Naidu

*Pragathi Mahila Samakhya's women prove: "Give us a little space, we can move the earth". Describes their resilience in procuring seed against all odds.*



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# Resilience to disaster

## Editorial

**B**esides more normal fluctuations in production conditions, many farmers have to cope with high impact hazards like droughts, floods, storms, earthquakes, epidemic diseases, war or economic crisis. These hazards make farming a risky activity and can become disasters resulting in loss of housing, stored food, crops, animals and even personal injury or death. There are also hazards that build up more gradually leading, eventually, to disasters with no less serious impacts. Examples of slow impact hazards are Global Warming, ecological degradation, HIV/AIDS, Green Revolution – Industrial Agriculture and economic globalisation.

Ecologists use the term ‘resilience’ to describe the process through which an ecosystem returns to its former state after it has been disturbed. We use ‘resilience’ in a broader sense, as the capacity of farmers (and other members of a community or society) to deal with disturbances and hazards by preventing and minimising losses and mitigating disaster to ensure food availability and sustain the agricultural production system. Farmers have developed many strategies to anticipate, cope with, resist, and recover from the impact of minor disturbances and hazards. When farmers begin to lose their resilience, their vulnerability increases, and so does the possibility of hazards turning to disasters. In rural areas, it is marginal people on marginal land – those with the least opportunity to build resilience in their livelihood systems – who are most affected by disaster.

### Disasters, an increasing problem

Disasters are becoming a major global problem, increasing in number as well as in impact on people. In the past decade

humanitarian assistance for disaster mitigation has risen sharply. For example, from 1990 – 1996, global overseas development assistance (ODA) for humanitarian assistance rose from USD 500 million to USD 6 billion – a twelve-fold increase and some 12 percent of all development aid. The interventions were in natural disasters and, increasingly, in emergencies of a complex political nature, often caused by serious deficits in governance and resulting in violent conflicts within and between states. Environmental degradation and socio-economic marginalisation are also important factors in the increase in incidence and impact of disasters. As disasters can have an enormous impact on rural livelihoods and their development, the challenge is to reduce the impact of hazards by strengthening the resilience of rural communities in pre as well as post disaster situations, the theme of this issue of LEISA Magazine.

### Resilience in traditional agriculture

In traditional agriculture, high levels of resilience were achieved by complex combinations of economic, ecological, social and spiritual strategies. Björnson and Gurung (p.6) show the wide variety of strategies used in traditional subsistence agriculture in the rugged Himalayan regions of Nepal where production is threatened by storms, droughts and floods. The available local resources and waste products are used optimally for a wide range of complementary products and services. Social arrangements and solidarity are fostered and emergency strategies are strictly followed for maintaining food security. The goddess of prosperity is worshipped i.e. for protection of stored

grains against bad weather, theft and evil spirits. Uran et al. (p.16) point to the importance of biodiversity, the social and cultural relations and subsistence perspective of local society for the resilience of farming in Flores, Indonesia. This is in strong contrast to the low resilience of the large-scale plantations propagated by the government.

Animals and forests make an essential contribution to the resilience of many traditional systems. Connelly and Wilson (p.10) document the role of forest products, in particular of the dom palm, in the survival strategies of the people living in the savannahs of the Western Lowlands of Eritrea affected by drought and war. The flexibility of the farming system appears to be crucial, so that households can easily shift between different economic activities: crop production, herding, collection of forest products, craft, trade or migration labour. In the post-war period the palm forests were crucial in re-establishing a normal social and economic system. However, the government has not recognised the importance of the forests for the local people and intends to transform them into irrigated agricultural lands for export production. This has caused serious tensions between the local population and the government.

### Coping with drought and floods

Shumba (p.8) reports on the research by SAFIRE in Zimbabwe on farmers’ responses to drought. It shows that farmers are not passive victims. They have developed their own, indigenous preparedness and mitigation strategies based on longstanding experiences of living with drought. Examples are: water harvesting and conservation, enhancing biodiversity, storage of food, saving of

money and drought tolerant varieties of indigenous crops. These indigenous strategies are often overlooked and undervalued by disaster specialists from outside. Such local adaptive strategies can sometimes be improved by combining them with contemporary scientific knowledge and an appropriate policy environment. Shumba states that the work of SAFIRE and other NGOs in Zimbabwe is showing that this can lead to more sustainable rural livelihoods.

With the increasing impact of Global Warming destabilising the global climate, resilience to drought, but also to floods and hurricanes, is becoming increasingly important to farmers. Agriculture in industrial as well as developing countries is responsible for an estimated one third of Global Warming (FAO:AG21:Magazine). But, it is increasingly being recognised that sustainable agricultural practices can strongly contribute to mitigating Global Warming (Pretty and Ball p.31).

### Farmers adapting to change

Society and agriculture are changing fast. Although the perturbing natural factors of the past are still active, many traditional strategies seem to have lost their significance. Population growth, modernisation of agriculture and education are mentioned by Björnson and Gurung (p.6) as processes that seriously impair the resilience capacity of Nepalese farmers. But also other processes such as climate change, labour migration, economic crisis, ecological degradation and HIV/AIDS are forcing farmers to adapt their strategies.

Often driven by stress, adaptation and innovation has become a normal part of farming as demonstrated in the articles by Björnson and Gurung (p.6), Uran et al. (p.16) and Holt-Gimenez (p.18). This can also be the case in post disaster situations. Vermaak (p.29) presents interesting examples of post disaster innovation processes building on local conditions. Daniel and Ignacy describe how by intense knowledge empowerment, within a span of three years the whole village started growing pesticide free paddy and also reduced use of chemical fertilizers. The work load for women has reduced and one of the farmers has evolved into a resource farmer in training other NGOs. (p.12). Marsh (p.14) stresses that 'It is time to celebrate the spirit of the African farmer!' With this he means that we should have more trust in the innovative capacity of farmers of which he gives some convincing examples. Women often take the lead in innovating and rebuilding rural livelihoods! To empower women to do so, ECTA in

Nepal has developed an effective low cost methodology (Sharma p.15). Farmers' initiative and innovative capacity are crucial elements of resilience and therefore should be enhanced and strengthened.

### Emergency agriculture

Provision of relief assistance to disaster victims over a number of decades has in many places resulted in the development of a dependency syndrome and a decline in self-help efforts. Relief must be provided to support agricultural recovery, but should not generate food aid dependency. This means that humanitarian assistance agencies must link with development agencies to promote rural recovery and development. This is not as simple as it sounds.

The tensions in approach and conditions between food and development aid make agricultural rehabilitation the forgotten child of humanitarian assistance. Emergency agriculture is needed to end the relief phase, to encourage restoration of the management of agricultural resources, to restore the market systems, to reduce vulnerability and to build up resilience again (O'Keefe et al p.29). Naidu and Ramesh present the Pragathi Mahila Samakhya's case which amply illustrates women's collective will power, synergies of interventions by development organisations and convergence between social organisation and knowledge empowerment. (p.24)

Disasters can also create opportunities to capitalise on the sudden inflow of resources to promote rehabilitation and longer-term development. Often, however, this is translated in terms of market agriculture and 'improved' technologies (especially improved seeds, chemical fertilisers and implements), which are not always adapted to the specific needs and conditions of farmers. Instead, emergency agriculture should build on local capacities to manage available resources and mitigate disaster. For example, instead of only providing improved seeds, farmers can be supported to recover a number of 'cherished' varieties adapted to the local conditions. This is being done by the 'Rescue from the Pot' project in post-war Sierra Leone by recreating the local capacity to multiply and exchange seeds (Kent p.22).

### Ecological agriculture

In a participatory study on the impact of hurricane Mitch in Central America on 1804 farms, conventional and alternative farmers concluded that sustainable agriculture applied by the farmers of the Campesino a Campesino movement is more resilient to hurricanes than

conventional agriculture (Holt-Gimenez p.18). In fact, Green Revolution agriculture, also in permanent large-scale plantations, e.g. of oil palms (Uran et al. p.16), contributes strongly to the increase in ecological vulnerability of agriculture, just as large scale deforestation and over-grazing and soil mining by low external input farmers. Supporting development of LEISA therefore is an important strategy to increase the ecological and economic resilience of agriculture, mitigate disaster and guarantee food security. In Zimbabwe, organic agriculture and Farmer Field Schools appear to be effective in improving the situation of rural women-headed households affected by the HIV/AIDS disaster (p. 27).

### Public pressure needed

The Mitch study has also uncovered a conspicuous "policy ceiling" in sustainable agricultural development. Farmers concluded that the prevalent national credit, market, agrarian and research policies favour Green Revolution agriculture, deforestation and marginalisation of small farmers, rather than more resilient, ecologically sound land use. The lack of a favourable policy context, and the lack of political will on the part of national governments to create one, appears to block development of resilient and sustainable land use. Existing natural resource policies are therefore responsible for enhancing disaster or at least making it more serious. How can we improve this situation?

In Europe, the crisis around the Mad Cow Disease, and the epidemics of the animal diseases 'Swine Fever' and 'Foot and Mouth Disease' are symptomatic of the increasing unsustainability and vulnerability of industrialising and globalising agriculture. As a result, some political leaders, especially in Germany, have finally accepted that drastic policy changes are needed to prevent further disaster (Reijntjes p.36). Apparently such changes are only possible once people start to experience the impact of disaster and public pressure forcing politicians to take responsibility for the agricultural production systems and the quality of food they produce.

Coen Reijntjes and K V S Prasad

# Out of balance?

## Resilience in farm level food security

Astrid Bjørnsen and Prem Gurung

Resilience can be defined as the capacity of a household to maintain basic sustenance in food and health. Farmers have developed manifold strategies to cope with frequently occurring minor stress factors resulting in fluctuating yields. Major disasters such as earthquakes or landslides, which occur periodically, are more difficult to prepare for. This article focuses on food securing strategies at farm and community level that contribute to a resilience capacity, and compares the disturbance factors and the resilience capacity of Nepalese farmers, then and now.

### Farming in Nepal

Subsistence farming and on-farm storage remain cornerstones in the livelihood of the majority of people living in remote and marginal areas of Nepal. Exposed to annual monsoon rainfalls in summer followed by a dry winter, farmers are highly dependent on seasonal production and storage of cereals. Production, moreover, is threatened by storms, periodic droughts, erratic rainfall, and unprecedented floods.

Efforts to modernise agriculture in Nepal were first initiated in 1956. As a result of the population growth after the 1950s, peasants encroached marginal farming environments and agricultural

production per capita stagnated. Urged to cultivate risk-prone areas, farmers became extremely vulnerable to food shortages. Since then the moderate level of household food security has turned to chronic food deficits in many areas (Seddon 1987 and Adhikari and Bohle 2000).

### Resilience in the past

In response to seasonality and fluctuating yields, Nepalese farmers developed several strategies -technical, economical, social, and spiritual - to secure food. Interestingly, the majority of them aim at prolonging food availability rather than increasing yield.

The most important *technical method* is storage. Depending on the availability of resources, the locality and climate, a variety of storage structures such as cribs, woven baskets, pots, mud bins, trunks, chambers, and ground pits are used, none completely insect-proof. Farmers generally tolerate insect damage and grain spoilage. Moulded grain is consumed even though the adverse health effects are known. Infested grain is used for brewing alcoholic beverages, while severely spoiled grain is used as livestock feed, allowing for optimal resource use.

Feeding livestock with grain is an important *economic solution* to enhance

resilience. It could be argued that farmers would do better using it for human consumption. However, farmers reason otherwise. Livestock is a hidden storage system. Surplus and inferior quality grain is converted to protein and other products. In times of need, livestock can be sold with added value and used for buying grain, if necessary.

Apart from human consumption and livestock feed, grain is allocated for seed, barter, payment and communal events.

Surpluses are also sold and invested in gold ornaments, the common 'insurance' against food shortage.

Supplementary food such as wild yam, taro, mushrooms, fern, nettles and asparagus was collected in the forests that were abundant in old days.

*Social aspects* in food security are often neglected. Women control and safeguard the stored commodity, determine the rate of consumption, and take pest control measures to prevent food losses. In times of food scarcity, women adjust the household and individual food consumption. Apart from reducing the number of meals, women, children and elders cut down their calorie intake.

In food deficit years, families postpone marriages that involve high costs in feeding the wedding party. To prevent high expenditure on life-cycle rituals, mourning households refrain from other celebrations for one year. Costs involved in death rituals can take years to recover.

In the past, social arrangements secured food at the community level for the needy. In Kathmandu, for instance, common property and giving of alms was common in former times. Until the 1950s, there was a system called *hundi*, under which needy persons were given everyday food items. In rural areas, two food securing systems were effective: the patron-client relationship and *dharma bhakari*, a grain store catering to the poor for religious merit.

*Spiritual means* of storage protection and food security have remained largely unnoticed. Grain is commonly stored inside the house to protect it from weather, theft and evil spirits. However, the storeroom is not an ordinary place; the presence of deities and spirits gives it a sacred character. For many Nepalese, children in particular, this room is an



Photo: Astrid Bjørnsen

'Dehri-making': Tharu woman of Gobardiha, Deukhuri, building a mud bin for storage of food grain.

erie location arousing fear and unease, and is entered only for storing and fetching grain.

Apart from the sanctity of the storeroom, the commodity contains supernatural qualities called *saha*, meaning 'an essence or life-force' or simply 'help' or 'plenty' - a phenomenon economising the grain use, therefore, prolonging food sufficiency. Adequate *saha* prevents food shortage and famine, and acts as a multiplying, replenishing force in the storeroom. In the past the preservation of *saha* was extremely important, as the procurement of alternative food grain was hardly possible. Hence, various rituals, traditions, ceremonies were developed for the conservation of *saha*. Lavish handling and unnecessary spoiling of grain, for instance, was considered to have a decreasing effect on *saha*, triggering the anger of the Goddess of Prosperity resulting in dwindling stocks.

### Resilience at present

Perturbing natural disasters still occur today, but are accompanied by new man-made hazards. These hazards are created in the process of population growth and land encroachment, leading to deforestation and land degradation. Resilience capacity is being seriously threatened by modernisation in agriculture. Farmers encounter unexpected difficulties with field and storage pests, as the introduced improved varieties are more susceptible than the local landraces. Traditional knowledge, old practices, and proven technologies are turning obsolete in the wake of modern agriculture.

Similarly, formal schooling prevents younger generations from traditional sources of education, preparing them for non-farming professions, and finally withdrawing them from farming. Forced by these changing conditions, opportunities and needs, farmers are adapting their coping strategies.

On-farm storage *technology* is changing due to increased storage pest pressure. The use of low-cost dusts and fumigants for grain protection is becoming increasingly common. Fumigation is of special concern as the use of phosphine gas in traditional non-hermetic storage structures triggers pest resistance and poses health hazards to the farmers.

The new *economic* food securing *strategies* differ from the past. Livestock is losing importance in the face of labour shortage caused by the education system. Wild foods have become scarce and are consumed in insignificant amounts. Instead, more land is being allocated for staple crops to meet the household food demands. Cash crops are becoming important sources of income in regions having access to road and



Photo: Astrid Björnson

'Kutti-finishing': Tharu woman plastering new mud bins with a layer of clay that is believed to have insecticidal properties.

market. Farmers mortgage their lands and raise cash to purchase grain during food shortages.

Moreover, a higher incidence of storage pests is altering the pattern of food allocation. More and more households sell their grain soon after harvest to avoid storage pest losses even though the prices are unfavourable at that time. In addition, high-quality grain is sold in order to buy a larger quantity of low-quality grain.

The search for food security leads more and more to options outside the household. Patron-client relationships, i.e. labour service for wealthier households, are becoming a common risk-avoiding strategy, as annual wages are independent of yield fluctuations. Children are given away as servants to reduce the number of mouths to feed. There is also an increasing trend of male migration for temporary and permanent off-farm occupation. All this leads to increasing household fragmentation and individualisation with severe impacts on social structures and safety nets. Male out-migration particularly overburdens women, who have to take up increased control of farming and family welfare.

*Social arrangements* such as the *dharma bhakari* have disappeared due to growing food insecurity, the general breakdown of social structures, the growing influence of individualization and the cash-based system, and the erosion of belief systems.

*Spiritual means* of stabilising food security and farmers' resilience capacity have been neither changed nor replaced by new strategies, but have simply lost their importance. Rituals concerning food security are still performed, yet the belief in the super-natural is declining. Rituals, however, form important links between farmers' past and present. They include ideological concerns such as the balance between human and nature,

important for social stability and mental well being. Especially in times when formal schooling devalues agricultural work and local knowledge, these rituals allow the farmers to place themselves in the universe, and to attribute importance to their lives. If this feeling of identity is lost, then the farmers' capacity to maintain mental resilience will be seriously affected.

### Conclusion

The fact that more and more rural households face food deficit indicates that the Nepali farmers have partially lost their resilience capacity in terms of food security. The loss of resilience is closely linked to the loss of options rendering the farming system vulnerable and sensitive to disturbance.

Farming in Nepal is clearly out of balance and the multidimensional approach of farmers to deal with environmental fluctuations, instability and food deficits requires continuous adjustment. The primary responsibility of development professionals is to enable farmers to generate diverse options enhancing their resilience capacity. Suitable options, however, need to be generated in close collaboration with farmers considering all dimensions of their livelihood. Research as a means to widen farmers' options, therefore, needs to be highly participatory, action oriented, and responsive to local needs and priorities.

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# Farmers' responses to reduce the risks of drought

Owen Shumba

**D**rought is a common phenomenon in the Southern region of the African continent and Zimbabwe is no exception. The annual average rainfall of Zimbabwe is about 600mm, but is markedly variable, particularly in drier regions. Since rainfall is the main climatic constraint to dryland agriculture, the country is divided into 5 natural regions for agro-ecological planning. Region I receives the highest rainfall while region V records the least annual precipitation. Farming systems range from intensive livestock and crop production in Region I to extensive beef production (ranching) in region V. However, some drought tolerant cash crops are grown in region IV and V. The lack of rain coupled with exceptionally high temperatures has been the cause of many droughts causing widespread disruption to many farming communities with the loss of crops and livestock.

Based in Zimbabwe, SAFIRE - The Southern Alliance for Indigenous Resources - is a collaborative initiative of several local and international NGOs, grassroots development agencies, government institutions, international organisations and individuals that assists rural communities in managing their natural resource base. Apart from its many activities, SAFIRE plays a pivotal role in the implementation of drought mitigation and preparedness initiatives in Southern Africa.

## Recurrent droughts

Since 1901 Zimbabwe has suffered recurrent droughts. According to literature, the worst years with below average rainfall are 1911/12, 1923/24, 1946/47, 1972/73, 1981/82, 1982/83, 1986/87 and 1991/92. In a survey conducted by SAFIRE across nine districts in Zimbabwe, farmers recalled 6 – 16 (on average 10) drought years from 1918 to 1997 (see Table 1). Farmers' definitions of drought were diverse, including agricultural, hydrological, economic and meteorological aspects. According to the farmers, droughts seriously affected them both in the normally wet and dry seasons.

## Impacts of drought

The 1991/92 drought had the most crippling effect in Zimbabwe and over

**Table 1: No. of drought years remembered by farmers across nine districts of Zimbabwe 1918-1997**

Rushinga	10	Mudzi	16
Nyanga	15	Chipinge	10
Mhondoro	10	Goromonzi	6
Chivi	10	Gwanda	9
Tsholotsho	10		

much of the sub-region with many countries in the region having seasonal deficits of up to 80% of normal rainfall. There were unprecedented crop failures. The subcontinent, usually a food exporter, had to import 11.6 million tonnes of food worth over US\$4 billion. Regional grain production fell some 60% short of expected levels. The droughts led to widespread suffering with loss of cattle and crops.

Farmers in the nine districts above summarised the major effects of these droughts as follows:

- Partial or complete crop failure (because of low soil moisture content and disease outbreaks)
- Livestock deaths
- Trees drying and dying
- Boreholes, rivers, springs and other water points drying and causing a scarcity of both livestock and human water supplies
- Shortage of basic commodities on the local markets
- Price hikes across all sectors
- High government expenditure because of food imports, especially yellow maize from Kenya
- Malnutrition, especially in children.
- Unemployment, coupled with rampant crime and robbery.

## Farmers' coping strategies

Farmers' responses to the effects of drought have been varied. Below are some of the actions being undertaken to mitigate drought, especially by women in Nyanga, Chipinge, Mudzi, Chivi and Gwanda districts.

- **Permaculture** All the farmers interviewed stated that they were learning permaculture and practising it, both in their gardens and fields.

Permaculture helps them prepare for drought through land use designs that enhance water conservation and biodiversity.

- **Water harvesting** Farmers are harvesting water from rooftops and diverting water from natural springs into tanks. This ensures that they have a substantial amount of water stored up. In case of a drought the stored water will be able to sustain them for about five months depending on the volume of the tank. The water is also used for supplementary irrigation of vegetables and crops.

- **Infiltration pits** Some farmers are digging infiltration pits along contours. Water collects in the pits during the rainy period. When the weather becomes dry, as in the case of early stoppage of rains, the water spreads underground and is used by the plants. Crops can grow up to maturity by using this conserved moisture. The farmers in Nyanga and Chivi stated that even if there are only 5 days with rain in the whole rainy season, the crops will reach maturity using conserved and harvested water in the pits.

- **Granaries** A majority of the farmers interviewed store food to be used in case of a drought. They have a specific granary stocked with grain (sorghum, millets, and maize for a shorter period of time), especially those resistant to post harvest pests. This granary is kept untouched and out of bounds for children. Only the head of the household is allowed into it.

- **Savings** A fifth of the farmers across the nine districts save some money in order to purchase food in times of drought. These are the affluent farmers with flourishing business enterprises who can set aside enough money to buy food for a whole year if the rains fail.

- **Drought tolerant crops** Some farmers are slowly discarding the idea of growing maize as the main crop. They are shifting to the use of traditional crops e.g. small grains, i.e. millets, sorghums. These crops are drought resistant and therefore give a good yield even with very little rain. Farmers are also looking for indigenous maize varieties (i.e. *Kalahari*) that are short season, high yielding, drought tolerant and post-harvest pest resistant. An indigenous

finger millet variety, chiraufe, is also planted in drought years. *Nyamunhororo*, a cucurbit, is popular as the small pumpkin ripens fast and saves people from possible starvation. It is not only drought resistant but can survive in poor soils. The early maturing cowpea variety *Vigna unguiculata* is also planted in drought seasons.

### Building on farmers' initiatives

It is evident that farmers are proactively doing something for their survival in times of disasters such as drought. The array of initiatives shows that community livelihoods are dependent on a number of activities, capabilities and assets including both material and social resources. Rural community livelihoods would be sustainable when they can cope with and recover from stresses and shocks such as drought, floods or even HIV/AIDS, and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base.

The main challenge for researchers, development practitioners and policy makers, therefore, is to facilitate this process and to build on what farmers are currently involved in. The main long term focus and goals of all drought mitigation projects implemented by SAFIRE and other partner NGOs such as ENDA - Zimbabwe, CARE Zimbabwe, Zimbabwe Freedom from Hunger

Campaigns (ZFFHC) and ORAP have been to strengthen community livelihoods. The livelihood conceptual framework illustrated below has been the guiding principle in most initiatives.

### Adaptive strategies

In its community drought mitigation initiatives in Zimbabwe, SAFIRE has sought to build on and promote the following community adaptive strategies:

- Multi-cropping to hedge against crop failure.
- Soil and water conservation (infiltration pits, tied ridges, water harvesting tanks and permaculture kitchen garden designs in general)
- Storage of a two year supply of indigenous maize and other drought tolerant varieties such as millet and sorghum.
- Income diversification (organic vegetable sales, organic cotton growing esp. with refugees in Zimbabwe, craft making, jam making and sales, soap making from *Jatropha curcas* oil, etc.)
- Community regulations and bylaws which control the conservation of certain trees and wooded areas.

### Contemporary knowledge

The following new knowledge is introduced:

- Participatory ecological resource assessments conducted together with the communities in project areas.
- Oil extraction technologies either developed or sourced for the communities.
- Simple irrigation techniques such as bottle watering and low cost drip irrigation promoted in project areas.

### Policy issues

The main responsibility of the government is to create an enabling policy environment, which will ultimately enhance the livelihoods of at-risk communities. Examples within the Zimbabwean context are:

- Land use/tenure: state vs community; agricultural modernisation: monocultures and cash at the expense of food security i.e. maize vs sorghum/millet.
- Marketing policies per se
- Livestock production and sale
- Promotion and legitimisation of indigenous knowledge by both government and researchers, especially in climate forecasting.

ENDA-Zimbabwe and the International Institute for Sustainable Development (IISD) have been in the forefront of analysing policies that impact livelihoods of rural people at-risk.

### Achieving food security

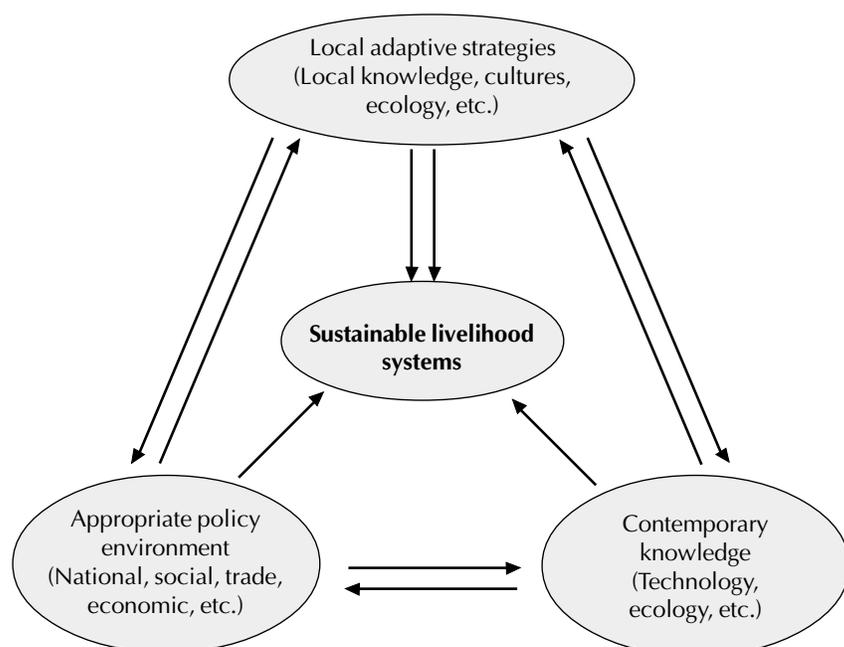
Apart from effective networking, NGOs and governments need to work together towards fulfilling the concept of sustainable livelihoods systems, as elaborated above. This way, food security and community resilience to drought can be achieved in Zimbabwe and in Africa as a whole.

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**Figure 1: Towards sustainable livelihoods and food security**



This figure represents the three main systems leading to sustainable livelihoods in Africa's semi arid lands. Sustainable livelihoods draw most from the adaptive strategies that people and nature have evolved together, but they will also require an appropriate environment of social and policy conditions and will draw on contemporary knowledge systems.

Source : Rennie and Singh (1995)

# Trees for semi-nomadic farmers: a key to resilience

Stephen Connelly and Nikky Wilson

Like many peoples of the dry lands of Africa, the farmers of the savannahs in the Western Lowlands of Eritrea have survived the variation and stresses of their hostile environment through developing a flexible farming system involving a mix of crops and animals, production for cash and for subsistence, and widespread dispersion of activities over hundreds of miles.

The resourcefulness and resilience of such farmers is well known and well documented. They are traditionally viewed by the outside world as semi-nomadic herders and opportunistic farmers ('agro-pastoralists'). In this article, however, we show that despite such views these farmers in Western Eritrea are also dependent on a third strand of the farming system: the management, collection and processing of forest products, and in particular of the dom palm (*Hyphaene thebaica*). This third strand is always important, but never more so than when disaster strikes – in times of drought and war forests become the key to survival.

## Disasters strike frequently

The Western Lowlands of Eritrea are the easternmost extension of the Sahel, lying between Eritrea's border with the Sudan and the Eritrean/Ethiopian Highlands. Principally covered in semi-desert scrub and savannah woodland their low hills and plains are interrupted by three river valleys clothed in remarkably dense woodland, some of it mixed acacia and dom palm and elsewhere almost pure stands of dom. They are home to several hundred thousand people of six ethnic groups, each of which has developed their own distinctive survival system, involving greater or lesser emphasis on animals, crops, palm fibre and other forest products. All these systems are characterised by flexibility, and all have been repeatedly disrupted by the natural and man-made upheavals of the past forty years.

A series of major droughts has struck the area (early 1970s, 1982-5, 1990-1, late 1990s), causing repeated crop failure and massive livestock losses and – in the early 1980s – a complete collapse of the farming system, many deaths and mass exodus of the population as refugees. At the same time the area has been ravaged



Photo: Stephen Connelly

Mature dom palm with harvested leaves drying on the ground.

by war: the Lowlands changed hands several times in the thirty years of liberation struggle (1961-91) and villages and crops were repeatedly bombed and destroyed by warfare on the ground. After liberation (1991) and independence (1993) farmers picked up the pieces and started farming again under more settled conditions, though facing new threats from government development policies, and then in 1998-2000 by renewed war that saw the invasion of the Lowlands by Ethiopian armies.

## Dependence on dom palm

At all times, forest products play a crucial role in people's livelihoods. The traditional farming system involves growing sorghum for food, and keeping camels, cattle, goats and sheep for food and occasional sale. Amongst all the tribes a vast range of subsistence needs (e.g. housing, tools, and some food) come from the forest, and for the majority of the Lowland population (belonging to the Tigre, the Beni Amer and the Hidareb tribes) the principal source of cash income is dom palm fibre. Palm leaves are cut on a massive scale from the riverine forests, and either sold in their unprocessed form or woven into mats, rope and other household utensils for sale in the markets of Eritrea and Sudan.

Under 'normal' circumstances - i.e. in peacetime and when rainfall is sufficient to allow at least some cropping and

herding – dependence on the forest is greatest for the poorer members of the community. Those with few or no animals, or who cannot farm land – such as the many war widows – rely on cutting, weaving and selling palm for their survival on a permanent basis, while even for most richer farmers the dom is a vital source of income, particularly during the lean months of the year. The population clearly values the forests highly. This has been a factor in its preservation: farmers that we interviewed described harvesting patterns governed by informal regulations and an understanding of the nature of dom palm regeneration and growth. These systems prevent over-cutting through restricting access and over-frequent cutting, and their overall impact appears to be a sustainable management system.

## Key element of resilience

In years of bad rainfall dependence on the palm forest increases as crop and animal production falls. In serious drought years cutting and selling palm leaves becomes the main source of income for most of the population – men travel miles from villages far from the rivers in order to cut palm leaves to buy food. At the same time food collection from the forest increases: dom palm nuts are a food of last resort for the poor in the hungry season before harvests, and in drought years they become a staple food for many.

One ethnic group – the Kunama – has a distinctly different approach to the

forest. They cut very little palm for income, but collect food from twenty or more tree species. These include the dom palm and others that they value as food reserves for drought years when their crops fail: for them the riverine forests are their insurance, rather than a regular income source.

Thus harvesting from the forests provides a key element of the resilience of the farming system, enabling poor farmers to survive from year to year and entire communities to weather the bad years, even to survive for a time when war makes farming impossible. Only in major droughts does the system finally collapse and people become refugees.

In the period of peace from 1991-98 the palm forests were crucial in re-establishing a normal social and economic system in the Lowlands, both for those who had remained and for those who were returning from refugee camps. Livestock numbers were low and many female headed households (war widows) and physically disabled people in the villages had limited ability to farm. Harvesting and export of palm leaves has consequently been a major source of support for the Lowland population.

### Forest or irrigation?

However, this revival of the traditional system has not been actively supported by the government's agricultural extension services. This appears to be partly because they recognise neither the importance of the forest to the farming system nor its sustainable nature. The

Lowland farmers are seen as 'agro-pastoralists' for whom trees are a minor aspect of the farming system, and there is a widespread – though unfounded – belief amongst officials that cutting is carried out in ways that damage the trees.

The other major factor is that the government has other priorities: the forests occupy fertile land with high water tables, which is ideal for irrigated agriculture of cash crops such as onions and bananas. Increasing production of these is a high priority, in order to feed urban populations, raise hard currency through exports, and to attract investment from wealthy (often formerly expatriate) Eritreans. Thus the traditional system and the government's preferred land use are in direct competition, and the appropriation and clearance of forest land has caused serious tensions in the Lowlands between local people and the government. Exacerbated by current and historical ethnic and religious factors, this conflict over a resource fundamental to local livelihoods contributed to unrest and the recurrence of violence in the Lowlands during the 1990s. Ironically, the recent (1998/2000) war between Eritrea and Ethiopia may have stopped the clearance of forests for commercial farming, though once again presumably forcing local people to rely on the forest as farming becomes impossible.

### Sustainable forest management

With the recent peace accord the question arises again of how local communities, government and – perhaps

- outside researchers and agencies can work together. Although the deeper animosities are undoubtedly still present and intractable, the more immediate resource management issues should not be impossible to solve. This would require, however, that the government recognises both the importance of the forest to the local livelihood system, and the right of local people to have continued use of and control over the forest. It would thus have to forego – or at least restrict – the issuing of licenses for agricultural production in forestland. More positively, government and local people could work together on improving sustainable management – particularly where large numbers of former refugees are being settled - and on the provision of raw material for the industrial use of palm fibre.

In **conclusion**, we can say that for many farmers in the Western Lowlands of Eritrea, the riverine forests, and in particular the dom palm, are an essential resource for their survival. They show great flexibility in switching emphasis between the components of their farming system (crops, livestock and forest) to meet changing conditions, but their ability to cope with the uncertainty of marginal farming and the stresses of war and drought is ultimately underpinned by their reliance on the forest for income and food. This dependency is even greater for poor people, and especially for those who are prevented from farming by physical disability or by social custom, as is the case with female heads of households. This dependency has been strangely neglected by both officialdom and outside agencies and researchers. We believe, however, that the sustainable exploitation of the forest under local management systems has huge potential to ensure that farmers' coping mechanisms are both preserved and enhanced.

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The authors carried out social and silvicultural research on the riverine forests and farming systems of the Western Lowlands of Eritrea in 1995/6, and returned in the summer of 1997. The views expressed in this article are those of the authors.

A full report is available as **Report on a preliminary study of the riverine forest resources of the South West Lowland Zone, Eritrea** from SOS Sahel International UK, 1 Tolpuddle Street, London N1 0XT, England (sossaheluk@gn.apc.org) or from the authors at nikkywiz@yahoo.co.uk.

*The dom palm products market, Keren.*



Photo: Stephen Connelly

# Agro Eco System Analysis for profitable paddy cultivation

Daniel Anand Raj and P A Ignacy

**F**armers face a high degree of risk and uncertainty and have to cope with several challenges including cost of cultivation which is increasing steeply.

In farming, the major external inputs requiring high investments are: the cost of labour, chemical fertilizers and to a certain extent - plant protection. The best way a farmer can earn a reasonable net income is through reducing investments on inputs, while maintaining the yield levels, thus increasing the overall profitability.

To know how much inputs are needed, the farmer requires a reliable tool to assess daily or once a week, whether the crop requires any inputs, how much and in what form. Dependence on conventional sources of knowledge, i.e., the pesticide or fertilizer dealers may not be a very good option. Moreover, the traditional agricultural extension system is far too 'remote' for an average farmer to have timely access to it. In a situation like this, **Agro Eco System Analysis (AESA)** is a handy tool for the farmer to independently take appropriate decisions at farm level.

## Agro Eco System Analysis in paddy

The four main objectives of AESA are to: a) grow a healthy crop b) conserve natural enemies c) keep the field under constant monitoring d) make the farmer an expert in understanding crop ecosystem. In agro ecosystems, ecological interactions between the environment, plants, herbivores (diseases, insects, and rats) and natural enemies of herbivores take place. The herbivores are balanced by their natural enemies. The interdependencies need to be understood well to know when pest control is really needed to prevent economic losses and maximise profits.

In a Farmers' Field School (FFS) for AESA a group of 20-25 farmers are organised into sub-groups of 5-6 farmers. Each sub group has a facilitator and the crop ecosystem is observed on a weekly basis.

The information is gathered by sampling. Sampling involves closely observing and monitoring a small part of a large field - around 20 plants in one acre or approximately 0.04% of the total number of plants in the field. Various aspects of the crop ecosystem are observed. The results of sampling are used to arrive at decisions based on

natural enemy ability, crop health status, probable yield etc.

The observations and assessment are depicted diagrammatically by the farmers themselves on a chart paper. (see diagram). The diagram depicts the: field condition ; growth stage of the plant; weather conditions during the past one week; moisture / water level; weeds; herbivore population (pests); natural enemies' population (beneficials); diseases; past experiences; economics.

The drawing forms the basis for discussions among farmers. AESA is aimed at empowering farmers to independently analyse and take decisions. The facilitator guides the process of discussion but does not take any decisions. Heavy emphasis is on discovery and exploration in the field. A lot of specimens collected from the field are used for stimulating discussions among farmers. Any query by the farmer is replied by another question to stimulate thinking process. eg., If the farmer asks, *What is this?*. Instead of providing an answer, the farmer is questioned, *Where did you find it ? . How does it interact with other insects, the crop and other plants?*

## Monitoring of yield components

As maximisation of profits is the final goal of AESA, the attention is focussed towards **yield components**. Yield components are monitored continuously throughout the crop growing period to assess the potential yield from the crop. If in any stage of the crop the development of yield components is less than expected, action is taken in terms of nutrient and other crop management practices so that the yield components are immediately boosted. We have to constantly monitor that the yield components are not affected by pests and diseases and even if they are affected, quickly assess whether such levels of damage to yield components would result in real economic loss or not. The yield can be determined by observing the following aspects: *Vegetative stage*: plant population and number of productive tillers; *Reproductive stage*: Number of panicles and Number of grains per panicle and weight of 1000 grains of paddy. The number of productive tillers is directly related to soil and plant

nutrient status which is determined by the various management practices. The yield components are compared every week for taking decisions.

## Decisions regarding plant protection

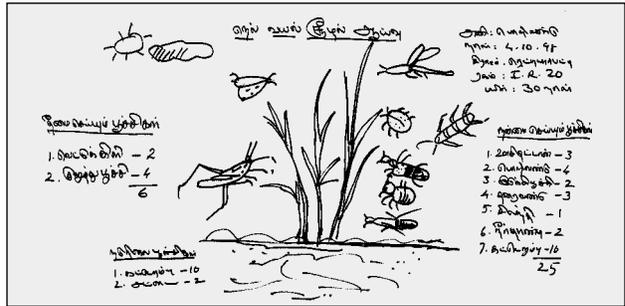
The decisions regarding control measures for pests is done based on the ratio of pests and beneficials. During an AESA process the type and number of pests and their natural enemies is analysed and documented.

Generally, the ratio would be in favour of beneficials. If the ratio is in favour of pests, the other criteria for decision making are: the state of the crop, the type of pests (to ascertain whether that particular pest could cause serious damage in that stage), the prevailing weather condition, whether it would favour the pests or otherwise, the profile of the predators - whether the predators are general predators or specific predators. Also, importantly, the compensation ability of the plant for the damage caused by the pests which is generally missed by the farmers. Normally, an increase in pest population immediately triggers farmers resorting to control measures. In the FFS, gradually they learn that plants have the natural ability to compensate for the damage caused by pests and the control measures are often not necessary as the damage does not have economic implications.

Field Experiments are done to simulate pest damage and to show the compensation ability of the crop and the ability of the natural enemies to keep the population of pests under check. By such field experiments, e.g. to see the effect of different degrees of leaf cutting and tiller cutting, farmers discover how to determine 'action threshold levels' and what actions to take.

The season long training goes on for 25 weeks. Initially, the farmers take more than 2 hours to complete the analysis. By the end of the season, they are able to do the analysis much faster. They look at the crop ecosystem holistically, instead of looking at pests alone.

Thus, the FFS approach empowers farmers with knowledge on various aspects of crop production - seed selection, seed testing, seed treatment,



land preparation, nursery raising, transplanting, water management (time and level of irrigation), use of farmyard manure and fertilizers and, disease and pest management.

By observing and understanding the crop ecosystem closely, the farmer can take informed decisions at the right time. Moreover, the group approach creates an atmosphere of discovery while building up knowledge.

Agriculture Man Ecology (ame) has been conducting FFS for AESA in collaboration with NGOs operating in the districts of Tiruchirapalli and Pudukottai in Tamil Nadu in India. *ame* has taken support of master trainers of Department of Agriculture and also examined the experiences of Food and Agriculture Organization (FAO) and CABI. Presently, more than a thousand farmers have been trained in AESA for paddy cultivation.

The **Knowledge empowerment** through collaborative processes resulting in increased self esteem and confidence can be illustrated by the **following case**.

### **Enamreddiapatti Pudur - a village growing pesticide - free paddy**

Enamreddiapatti Pudur also known as E.R. Pudur is about four kilometres from Vaiyampatti in Tiruchi district of Tamil Nadu. Most of the cultivable area has irrigation facilities. The cropping pattern is predominantly paddy while other crops are: cotton, groundnut, ragi, maize and vegetables. Farmers reported the use of various pesticides like monocrotophos, quinalphos, BHC, metacid, cimbrush, oxynol, sevin, etc.

Located in this village is one of the Sangams organised by Association for Human Interventions and Massive Social Action (AHIMSA), an NGO based in Vaiyampatti.

In 1997, *ame* Tiruchi conducted a training programme on crop production, social organisation and gender issues for the staff of AHIMSA. The training was based on a PRA conducted in the village. The results of this PRA indicated the need to increase profitability of paddy cultivation. This could be achieved by reducing the cost of cultivation and improving the productivity. Thus, the village was selected for conducting FFS in paddy.

AHIMSA organised the farmers while The Department of Agriculture (DOA) assisted by making available a master trainer for the FFS - a true collaborative effort between *ame*, Tiruchi, AHIMSA and DOA.

### **Adult learning - initial reluctance changed to heightened enthusiasm**

Initially, AHIMSA found it difficult to organise farmers for the FFS. Only a few farmers came at 7 am for the FFS session. It was only after 2-3 sessions, that more farmers got interested and started attending FFS regularly. Based

on household approach, ten families were included in FFS. It was envisaged that at least one man and one woman from each family would participate in the season long FFS training. Finally, the FFS was attended by a group of 20 farmers (14 men and 6 women) in the 1997-98 crop season.

Some of the farmers who were members of the Sangam but not belonging to FFS group also got interested in FFS training. Initially, AHIMSA, with the guidance of *ame*, trained the farmers. Later, they started conducting the FFS on their own in other villages.

### **Intensive knowledge empowerment**

Farmers learnt to identify pests and predators and were able to work out the economic threshold level (ETL) of pests and diseases. The weekly FFS sessions made the farmers well versed in seed treatment, strip transplanting, water management, fertilizer management and AESA in pest and disease management. In short they were trained in Integrated Crop Management (ICM).

### **From heavy pesticides ... to bio-pesticides ...to zero pesticide use**

During the first crop, farmers found it difficult to restrain themselves from spraying the crop, particularly when they observed their neighbours were doing so. As a compromise, it was suggested they spray neem oil and soap mixture in case of pest attack. This, perhaps, helped in keeping their interest in ICM alive.

The good harvest, without using pesticides, brought about the required confidence level among the farmers. In the following season, some of them did not use even neem oil and soap mixture. In the next crop season (1998-99) other farmers felt encouraged to follow these practices.

Gradually, in a span of just three years (by 1999-2000) the whole village started growing pesticide free paddy and also reduced the use of chemical fertilizers. The yield levels are either the same or have increased in some cases up to 100 percent.

### **Cost of cultivation lower**

The cost of cultivation of paddy has reduced from Rs 7250 to Rs 6300 per acre, a net gain of Rs 950/acre to the farmers (NGO records). The savings are due to non-use of pesticides, reduction in seed rate and reduction in the use of chemical fertilizers; availing revolving fund loan provided by *ame* for timely inputs through the sangam instead of depending on loans based on high interest from money lenders / input suppliers.

### **Reduced work load ... women empowered**

ICM practices have decreased the workload of both men and women. Weeding in the first phase of crop is not given much importance in ICM as the

weeds harbour many beneficial insects. Stopping the use of pesticides means lesser work for women.

Involvement of women in FFS helped in faster adoption of ICM practices as both the decision makers in the household were at the same level of knowledge. Particularly helpful, where woman, for various reasons, was solely responsible for cultivation. In spite of initial resistance from the men in the family, the success of the women farmers helped them in earning respect in the family and society and raised their self esteem and confidence.

#### **How Raju's life changed**

*Raju is a marginal farmer. He owns 60 cents (2400 sqm) land. He was harvesting only 6-7 bags of paddy from the land before joining FFS. Since size of holding is very small, he follows intensively all the steps suggested in FFS. The integrated crop management (ICM) practices, which he learnt in FFS have helped him to double the yield of Paddy from 6-7 bags to 15-16 bags. With his enthusiasm and interest in ICM, he has become a resource farmer strongly advocating these practices. He claims that after his successful efforts, about 10 relatives of his have started following ICM practices. He has popularised the ICM practices amongst farmers who are members of Milk Society, in the neighbouring villages. They discuss these practices while going to deliver milk. According to his estimates, about 300 out of 550 farmers in the neighbouring villages are following some of the ICM practices and have stopped using pesticides on paddy crop.*

*Encouraged with success, he has purchased 10 goats and 3 cows to get enough farmyard manure and also to supplement his income from crop production.*

The FFS has also helped in training a farmer in the village as a Resource Farmer for training by other NGOs. The staff of AHIMSA is now conducting FFS on their own. Their services are being utilised by other NGOs in the area to conduct FFS in paddy.

### **Spreads to other villages...**

Besides the village, the practice of growing pesticide - free paddy has spread to relatives and farmers of neighbouring villages.

*Enamreddiapatti Pudur breathes cleaner air... while drudgery involved in paddy cultivation has reduced significantly.*

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# It's time to celebrate the spirit of the African farmer!

Nigel Marsh

Aid agencies can do a lot to help farmers become productive again after a major crisis, but it is the spirit, ingenuity and effort of the farmers themselves that should be celebrated more. Examples from East Africa demonstrate how creative partnerships between humanitarian organisations and farming families can transform devastation into prosperity, and even 'drought-proof' communities.

## Building on farmers' insights

The era of large-scale development interventions imposed by outsiders on a pliant rural population is, hopefully, gone forever. One does not have to travel too far to find yesterday's massive diesel-powered irrigation scheme lying redundant or a vast cash crop estate bled dry by corrupt officials. Surely everyone now accepts that it is best to build on farmers' own insights and experience, rather than 'take over' with an idea or a project that ordinary farmers can never genuinely feel they own.

Rwandan farmer Julienne Mukaremera's initiative is a good example of one that took wings because it was locally hatched. In 1996, she and her family came as returnee-refugees, from what was then Zaire to their former land in Gikongoro prefecture. Like virtually everyone else in Rwanda, Julienne's family started again from scratch. Watching her hungry children, like so many other mothers, made Julienne find reserves of energy and imagination she had not needed before. She pressed the World Vision workers, who had given her a hoe and some seeds, to help her set up a local farmer association, reviving an idea that was common before the 1994 war. Encouraging her female neighbours to join her in crop multiplication and terracing projects, she quickly took charge of not only her own association, but a whole group of associations – including some run by men. Together they established a farmer's store to sell seeds, tools and inputs to members, with profits redistributed among them at the end of the year. And in just a couple of



Photo: World Vision / Nigel Marsh

Julienne Mukaremera.

years, they began to recreate the thriving community that they had lost during the war.

## Women take the lead

A focus on women is one of the key elements in many successful agricultural interventions after crises. Be it in Burundi, northern Uganda or Somalia, it is so often women who take the responsibility, make the changes, push the local agenda. Several years ago a local leader in southern Sudan, Mary Nybol, was almost brutal in her denunciation of men who, for traditional reasons, resisted newly introduced ox-ploughing techniques.

*"I am very proud to get the chance to tell our men to bring their bulls for training. Our men are too dictatorial. They think bulls should only be kept for marriages," she said, referring to the traditional practice of buying brides with oxen. "We are going to convince them they are wrong", she added bluntly – and who is going to argue with a woman who has given birth 19 times? "We women are coming up, after a very hard struggle, and the men are going to accept us. We think more technically than our men do. We want to change the face of our land and the behaviour of our community".*

A year later, aid workers helped an association of elderly widows in her district of Bahr El Ghazar to start its own co-operative. By then, though, men were already queuing up alongside their womenfolk to learn how to plough with precious cattle, partly because of the leadership and example of Mary Nybol.

## Communal work and private ownership

Co-operative ventures are often better than attempts to help farmers prosper as individuals. One of the encouraging

examples in Kenya is a co-operative irrigation scheme at Morulem in the drought-ravaged Turkana district. Here, farmers have been shown how to dig and maintain shallow wells and use them for irrigation. The scheme, which began in 1992, benefits 1,228 farming families who own half an acre of land each on which they plant maize, sorghum, fruit trees and vegetables. They share their labour in tending their individual plots, and are jointly responsible for maintaining the irrigation scheme. The land has a plant nursery with 30,000 fruit tree seedlings.

The combination of communal activity and private ownership seems to foster the best instincts of everyone, and the current drought is demonstrating the results. While more than half of the 447,000 population of Turkana resorts to relief food, the people of Morulem are enjoying a harvest and even selling surpluses. Morulem has been so successful that other Turkana communities are now clamouring for help to establish similar schemes.

## Simple projects, sound results

Generally speaking, in places prone to frequent disaster or insecurity, simpler schemes are more successful. Hand-dug wells, where they are possible, are better than bore holes which need costly maintenance. Ox-ploughing is more sustainable than importing tractors. Anything that involves tapping into the abilities of the community is going to succeed more readily than an importation of technology.

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# Empowerment mobilisation for effective women's development

Raju Sharma

The Women's Empowerment Program (WEP) implemented by Pact was launched in December 1997. The main goal of this project is to empower 120,000 women from 21 lowland districts in Nepal to increase their roles in household decision-making, increase income for family well-being, and engage in collective action for necessary changes in their communities.

Education Curriculum and Training Associates (ECTA), a Kathmandu-based local NGO, has introduced the **Appreciative Planning and Action (APA)** approach as part of the low cost empowerment package being developed and applied under WEP. APA has proven to be a very effective and powerful tool for community mobilisation and motivation and for bringing about positive changes within organisations. The APA methodology is now being used successfully within other large organisations in Nepal, including NGOs, INGOs, donor agencies, and a major 5-star Hotel.

## Women's Empowerment Program

The Women's Empowerment Program has developed three interventions:

- **Literacy.** Women study a self-instructional manual in-groups of two to twelve, achieving literacy for all members in about three months.
- **Economic participation.** Follow up to the literacy package with neo-literate material with an economic focus. Women learn best practices for saving, credit, and income generating activities. This component includes three self-instructional manuals which women study in their groups for about nine months (3 months per manual).
- **Rights, responsibility and advocacy.** This component, implemented by The Asia Foundation (TAF), includes a role for an outside facilitator since the material is a bit harder to understand than the literacy and economic packages. Pact and ECTA do not provide facilitators, black boards, lanterns, or stationary which are normally supplied by other literacy programs, under the WEP principle that **'Dependency is not Empowering.'**

## The seven D's of APA

APA, as a starter methodology, does not take more than 2 hours to generate a



Photo: Raju Sharma

Women gain literacy by studying together using their own resources.

feeling among women and their groups that they can do many things on their own and do not need to wait for outside aid or financial assistance.

First, a positive and happy tone is set among the members. For this purpose, they are asked to recall and draw: *What are the most exciting things they have done in their communities with their own efforts that make them proud even today when they remember them?* This process is called **'Discovery'**. Since most people tend to forget their successes and rather focus on their failures, they are encouraged to think about their successes, and to understand and appreciate them. Recalling their successes fills them with energy and joy.

The second step is called **'Dream'**. The question here is: *What do you want your village and your children to be like after about 10 years time?* Here, they draw their colourful dreams and enjoy them. One concept emphasised is that if they really believe in their dream of something and sincerely work to achieve it, there is nothing in the world that they cannot achieve. Since these dreams are built directly on their own real accomplishments, they enable people to dream of things that are really achievable.

The third APA question encourages them to plan what they need to do in order to turn their dream into reality. If many needs are mentioned, they are prioritised according to necessity whilst focusing on the first among these. This they do by adding numbers to the pictures or expanding them to outline what is

needed to pursue their project. This process is known as **'Design'**.

The fourth question is for each individual: *What will you commit to do in order to start to make your dream come true, to make your own or future generations' life easier and happier?* Here, each of the group members commits to at least one thing she can do towards achieving their plan. After each member stands and makes her commitment the group celebrates by giving a big applause. This part is known as **'Delivery'**.

To further enhance the progress, the fifth question is put forward: *What can you do to initiate the project or the plan within 5-10 minutes time?* Here they will try to get started by making a detailed plan or drafting a needed letter. This is just to give a push towards their plan, and is known as **'Do it Now'**.

Before the end of the session, they are made to realise what was achieved that day. This is done by asking them to reflect on the good things that happened in the short meeting: *What was the best thing about today's discussion? Why was it the best part?* This is called **'Discuss/ Dialogue'**.

**'Dance and Drum!'** is the end of the session with entertainment of 'Singing, Drumming and Dancing.' Here all are encouraged to dance and sing so that they leave in a very happy mood. ■

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# Far from all oil palm turmoil

Gabriela Uran, Dina Hartono and Rik Thijssen



Photo: Rik Thijssen

Working together on the land.

Oil palm has been one of the most vigorous agricultural sub-sectors of independent Indonesia. Since the 1970s, its acreage expanded from 100,000 ha to 3 million ha in 2000. This profuse growth has provided important economic benefits, but has also become a source of concern! Oil palm's high yields of edible oil correspond to application of high quantities of chemical fertiliser and pesticides. Much of the expansion of oil palm monoculture has been at the expense of Indonesia's tropical forest cover, and has displaced local communities without proper compensation (Hakim Bayar, 1999). It has also been held partly responsible for the forest and land fires during the 1997/98 El Niño phenomenon.

## Unsustainable oil palm industry

During Indonesia's current period of economic crisis and political change the many weak points of this sub-sector were unveiled. In 1998, crude palm oil production declined for the first time since 1969. This decline was attributed to several factors, including increased production costs, difficulties to access credit, a 50% drop in the world market price of palm oil, as well as environmental effects, jointly exposing the rather unsustainable nature of the oil palm industry (Casson, 2000). Large financial losses were recorded and, technically, the main palm oil companies went bankrupt. Social unrest increased in and around oil palm estates.

## Farming on Flores

Oil palm plantations in Indonesia are largely confined to the islands of Sumatra (78%) and Kalimantan (16%), where infrastructure exists for production and processing, or lowland is available in plenty. On Flores, the tenth largest island of the Indonesian archipelago, there are no oil palms. Largely 'forgotten' by the Central Administration, this island is frequently shaken up by earthquakes and volcanic eruptions. Flores is carved by deep ravines and rugged valleys; rainfall

is unreliable and highly seasonal and can make water scarce. Understandably, it is not a first choice area for large-scale production of palm oil.

Instead, the dominant palm on Flores is the versatile coconut palm, found up to about 700 masl, on home compounds or in fields mixed with crops and sometimes livestock. It provides food, drink, oil, medicine, cash, fibre, timber, thatch, mats, fuel and domestic utensils. And it has proven to be one of the reliable cornerstones of the local way of life, even during periods of hardship.

When asked how the economic crisis or current political situation has affected their lives, local people often respond with a shy smile. Almost apologising for not being part of the real world, the world that has been so strongly affected by these major issues, Flores' people seem to have emerged largely unscathed. Of course, these events did not pass completely unnoticed. Many Florinese migrants returned home from Java and Malaysia because of losing their jobs. Prices of daily necessities and services increased manifold. But so did the market price of agricultural produce. Cacao, vanilla, cloves and Robusta coffee suddenly made record gains.

Besides this, rural inhabitants have, almost automatically, used their long-tested coping skills to provide enough food and other needs for all, including the returning labour migrants.

## Still largely self-sufficient

Different cultures of Flores have their own systems of sharing food in times of shortages. Generally, borrowed food is paid back at a later stage in the form of food. Families never hide their food stock from others in the community. Maize is even stored in trees or open, simple bamboo structures in front of the house. Such security nets are especially appreciated by women who bear the responsibility for the family's food supply.

Women also expressed that they would feel very uncomfortable if the economic situation does not permit them in using certain 'luxury' goods such as sugar, soap and fuel for lighting. They would genuinely feel *malu* (embarrassed) when visitors arrive at their home, and they are not able to prepare coffee because sugar is not available or if friends stay away in the evening hours since there is no light in the house.

Farmers in the field: "there is great interest from the local communities for mangement of natural resources as well as for further diversification of plant species on their land".



Photo: Rik Thijssen

Florinese women, therefore, depend on alternatives. Buying sugar, soap and paraffin from a shop is, of course, preferred. But when cash is not available they resort to resources straight from nature. Good sugar can be obtained from the sap of the arenpalm (*Arenga pinnata*), and also from the coconut palm. An alternative for soap is to use black lava stones or the small brown fruits from the local tree *Mengkudu* (*Morinda citrifolia*) for washing clothes. The latter also provides body soap or shampoo. Improvisation for lighting the house comes from a combination of two other very common trees: kapok (*Ceiba pentandra*) and kemiri or candlenut (*Aleurites moluccana*). For this purpose, kemiri nuts are crushed until the oil starts seeping out. Kapok fibres are then mixed with the kemiri paste and twisted around a stick to produce a 'candle'. Not surprisingly, coconut oil - the common vegetable oil on this island - can also be used for this purpose.

### There is always something to eat

Before the 1920s, when rice was introduced on this island, the Florinese were strictly hunters of small game and swidden farmers growing mostly bananas and cassava. Their main farming method, slash and burn, caused serious erosion problems.

Assisted initially by devoted catholic missionaries and more recently by several local and a few international NGOs, people have settled and become serious farmers. The traditional staple food was short of protein and had been the reason of many health problems. Adoption of the introduced species maize and rice, as well as increased attention to some indigenous species including cocoyam (*Colocasia esculenta*) and forest turnip (*Pachyrhizus erosus*) have not only brought the much needed diversification, but also increased food security in times of hardship. Local people can assure you now that 'there is always something to eat'. If rains are not plentiful and rice and maize yields are not enough, stocks of the other less drought-sensitive plants are utilised. Apart from these starch providers, people now plant a variety of pulses and vegetables. Perennial cash crops have become common, while families tend to keep a few small livestock. And the sea yields fish that can be salted or dried in order to be stored for more difficult times.

### Recent innovations

Community based agricultural development projects, such as the ones facilitated by FADO (*see Box*), are for instance involved in soil conservation and soil fertility work. Large areas on

slopes have been terraced and leguminous shrubs such as *Gliricidia sepium* and *Calliandra calothyrsus* have been grown as terrace stabilisers and green manure or fodder crop. Building erosion control structures is exhausting work, yet working together in groups always provides a stimulus for completing the job.

Many farmers have started making use of liquid manure made by fermenting leaves of leguminous species, sometimes mixed with animal manure, in barrels filled with water. Some are so enthusiastic about the results achieved in rice and vegetable production that they have invested in building concrete containers, dug in the soil, for fermentation of the organic matter.

Other spear-points in these projects are integrated pest management and planting of various perennials, cash crops as well as different fruit and timber species. Attention is also given to forms of more intensive goat production.

### No interest in increasing profit

Interesting to note here is that there is great interest among the local communities for management of natural resources, as well as for further diversification of plant species on their land. However, it seems that intensification of farm enterprises is not really what they are after. People are focused on satisfying their needs rather than making efforts to increase profit from one single enterprise. Coffee, for example, is making a good price these days. But farmers with coffee have not changed their routine. Pruning of coffee is not practised while shade is provided in plenty to the coffee trees using, for instance, *Erythrina variegata*. Such a

system may provide lower yields, but under relatively low standards of cultivation it also gives more even annual cropping and extends the productive life of the coffee plant.

The few goats kept by most families are used in case of festivities and special ceremonies. Economic crisis or not, the Florinese love to sing and dance while traditional and catholic ceremonies are an important aspect of life and are still proudly performed. There are, however, no farmers venturing into commercial goat rearing, although quality tree fodder (*Gliricidia*, *Calliandra*) is plentiful nowadays.

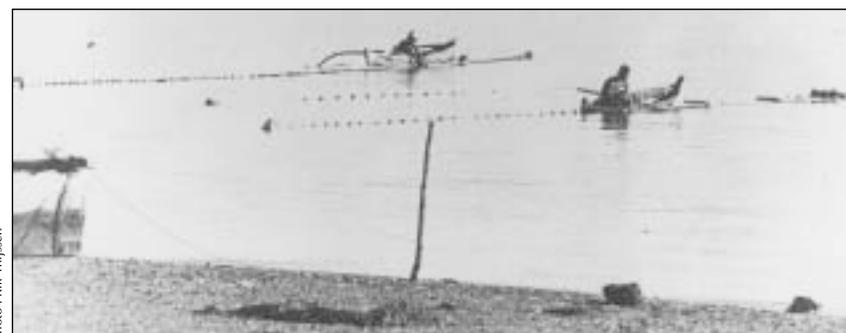
### What has been learned?

Given these project experiences, the worst must be expected from a newly launched government credit and extension programme, funded by IFAD, which aims at converting 20,000 ha of community land on Flores into monoculture cashew nut plantations. *Would it really be too far away from the oil palm schemes to have learned a lesson?*

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Fishermen collecting their catch near the shore.

### FADO

FADO (Flemish Organisation for Assistance in Development) provides support to 34 Indonesian NGOs spread over 7 Provinces in Indonesia. On Flores, FADO is involved in agricultural projects with 10 local NGOs.

The focus of FADO's programmes in Indonesia is empowerment of farmers through developing sustainable agricultural practices with low external inputs, and building strong farmer organisations. In the programmes, FADO role is mostly in backstopping to increase organisational and technical capacity of local development actors. In early 2001, FADO merged with two other Belgian NGOs: Vredeseilanden and Coopibo.

FADO was co-responsible for the translation of ILEIA's publication **Farming for the future** into the Indonesian language. **Pertanian Masa Depan** 1999. Penerbit Kanisius, Yogyakarta.

Photo: Rik Thijssen



Photo: World Neighbors

Sustainable plots had 20% to 40% more topsoil

# Measuring farmers agroecological resistance to hurricane Mitch

Eric Holt-Gimenez

In October of 1998, Hurricane Mitch, one of the Caribbean's five most powerful hurricanes of the twentieth century, slammed into **Central America** causing US\$ 6.7 billion in damage to infrastructure and industry (primarily agriculture) an amount approximately equal to 13.3% of Central America's GNP. Two meters of rain in less than one week coupled with mudslides and landslides washed away crops, animals, buildings, roads and bridges. Topsoil, lost from hillside farms, silted rivers that overflowed their banks, flooding fields and urban areas. Over 10,000 people died and 3 million were displaced or left homeless. The environmental damages were incalculable. The countries hardest hit were Honduras, Nicaragua and Guatemala. All areas affected by Hurricane Mitch are characterised by an uneasy mix of large-scale plantation agriculture and extensive cattle ranching (primarily for export) alongside small, very poor, subsistence farms. The hillsides and fringes of the large holdings are surrounded by mosaics of hundreds of thousands of poor rural families who eke out an existence by farming basic grains on ecologically fragile land and by engaging in a myriad of other seasonal, part-time, informal rural and urban work. Most observers agree that the unprecedented magnitude of the disaster is the consequence of decades of deforestation, non-sustainable agricultural practices and other forms of environmental degradation that left the

region exceptionally vulnerable to an erosive event.

## 'Sustainable' farms suffered less

While first reports regarding agricultural damage simply indicated that the levels of destruction were massive, subsequent on-site observations began to reveal a more subtle, differentiated pattern. Farms using what are commonly understood to be 'sustainable' practices appeared to have suffered less damage than their 'conventional' neighbours. These farms belonged to smallholders working within a multi-institutional, regional movement for sustainable agriculture (agroecology or LEISA) known in Central America as Campesino a Campesino (Farmer to Farmer). The farming practices commonly encountered in Campesino a Campesino included a wide range of soil conservation and sustainable cultivation methods, tested and promoted by smallholders for nearly thirty years. Most common amongst them were soil and water conservation methods, reduced or discontinued use of chemical inputs, cover crops, agroforestry, in-row tillage, organic fertiliser and pesticides, and different forms of Integrated Pest Management.

## An opportunity to compare impact

In general, these sustainable farms exist as islands and archipelagos within a greater, conventional 'sea'. While often localised and geographically fragmented,

they provided an excellent opportunity to compare the agroecological resistance to the hurricane of sustainable farms to that of conventional farms. The presence of Campesino a Campesino, made up of farmers and technicians experienced in farm experimentation and farmer to farmer training, also provided the opportunity to carry out an extensive, participatory, action research project in the low, medium and high impact areas of Hurricane Mitch. Several researchers with years of experience working in the Campesino a Campesino Movement designed a study and wrote a proposal. World Neighbors, an NGO working in the region, agreed to sponsor the project, helped to find funding (Ford, Summit, Rockefeller and Inter-American Foundations), and provided administrative support.

## Much interest in the study

From February through May of 1999, 40 different NGOs with sustainable agricultural research and development (SARD) projects trained and mobilised 100 farmer-technician teams and 1,743 farmers to carry out paired observations of specific agroecological indicators on 1,804 neighbouring, sustainable and conventional farms. The study spanned 360 communities and 24 departments in Nicaragua, Honduras and Guatemala. The primary objectives of participating in the study were threefold: First, farmer-promoters and NGOs in the Campesino a Campesino Movement were eager to

compare their farms to conventional farms because demonstrating a higher level of agroecological resistance would imply a higher level of sustainability. After years of being told that sustainable agriculture was not 'viable', nor 'economical', they were anxious to dispel doubts about the importance and effectiveness of their practices. Secondly, NGOs were very interested in evaluating the effectiveness of years of support for farmer to farmer SARD. Commonly, these projects are evaluated on the level of implementation (number of workshops, participants, terraces, compost heaps, etc.) However, the study gave them an opportunity to evaluate the level of their agroecological impact. Finally, all participants were interested in influencing the agenda for agricultural reconstruction after the hurricane. If farmers could show that sustainable farms were more resistant than conventional farms, then a strong argument could be made for a participatory, sustainable agricultural reconstruction strategy.

### A collaborative action

An intensive period of organising, training, data collection and field monitoring began in February of 1999. It was crucial that field data be collected before the onset of the rainy season in late April. Each team had one technician and two farmer-promoters. They carried out observations on the ten best examples of sustainable farms and on the ten neighbouring, conventional farms. Paired observations had to be located in close proximity, in the same position and cardinal orientation in the watershed, have the same general slope and similar environmental surroundings (fields, trees, infrastructure, etc.).

Agroecological indicators included topsoil depth, rill and gully erosion, percent vegetation, crop losses and structural damage. Each team member specialised in specific steps and measurements of the field procedure to reduce and standardise observational errors. The owners of both farms in the paired observations accompanied the team on both sustainable and conventional plots, then signed off on the field sheet indicating measurements and observations had been free of bias. Technicians interviewed farmers regarding their observations of the hurricane, the damage patterns, and the different reasons for any agroecosystem failures. National research coordinators in each country held periodic sessions with teams for feedback, troubleshooting and the correction of field errors.

### Significant differences

Field data from the farmer-technician teams was entered into an interactive

ACCESS database for each country. Initial results (averages) were processed for distribution among participants. While there was some local variation, the overall results indicated an overwhelming trend of higher agroecological resistance on the sustainable farms. Sustainable plots had 20% to 40% more topsoil, greater soil moisture, less erosion and experienced lower economic losses than their conventional neighbours. Statistical tests showed that some of these differences were highly significant (there was only a 0.0001 probability that these differences were due to chance) and most were acceptably significant (0.02 to 0.05).

### Conventional farmers convinced

Fifteen different workshops were held in the countryside to share the results of the field research with participants and key local and municipal actors. Farmers, promoters, technicians and project coordinators collectively analysed the results and gave feedback. Sustainable farms had fewer and smaller gullies and areas of rill erosion. All of these indicators were seen as contributing to both productivity, and to the conservation of the watershed. Further, because of crop diversification, sustainable farms averaged lower economic losses, and in Nicaragua even showed profits, despite the hurricane. However, when correlated to steep slopes (>50%), high storm intensity and other extreme environmental factors, some of the differences between sustainable and conventional farms 'collapsed', indicating that these techniques have thresholds of effectiveness. Finally, the participants themselves indicated what could be the most impressive result of all: over 90% of conventional farmers participating in the study indicated a desire to adopt their neighbours' sustainable practices.

### A learning process

Participants enthusiastically claimed that the study had been a highly successful learning experience, and one that had established new bonds of trust between farmers, promoters and technicians. For most farmers, it was their first experience with research, and for others, the first time results of on-farm research had been returned and shared with them. The study also revealed that, at the local level, many organisations and farmer groups had mobilised themselves already in response to the humanitarian emergency situation. Farmer to farmer groups helped to motivate self-help efforts in their communities, rather than simply waiting for outside assistance. This capacity for self-mobilisation among farmer groups indicates that resilience has a social as well as a technical dimension.

### What's needed for scaling up of SARD?

With the aid of drawings, clay models and skits prepared by the participants, farmers then described how their fields and villages should look in three, five and ten years hence if agricultural reconstruction was implemented using farmer to farmer, SARD techniques. Then, farmers analysed the obstacles to the scaling up and scaling out of SARD, and suggested projects and policy ideas for participatory, sustainable agricultural recovery. In general, technology and training methodologies were not seen as limiting to SARD. After all, farmer experimentation, cross visits and farmer to farmer training are the pillars of the Campesino a Campesino Movement. However, it was strongly felt that national credit, market, agrarian and

### Vetiver Grass for disaster mitigation

Last year, around Christmas and New Year thousands of Venezuelans had a miserable time just trying to survive the floods that have ravaged their communities and homes. Although we do not know the details of all the causes behind the flooding and mud slides, we know that when vegetation is removed and the soils become fragile, even moderate rainfall conditions can bring about a calamity.

Vetiver Grass Technology (VGT), if used to stabilise agricultural land, peri-urban building areas, deforested hillsides, riverbanks, levees, and highway embankments, could help to reduce the damage that might occur from future high rainfall in Venezuela. The Vetiver Grass Network strongly urges policy makers and relief agencies to consider VGT as an important tool for rehabilitation and to provide jobs for thousands of unemployed people.

VGT has proven very effective in the Far East for protection against cyclones, just as in El Salvador and Honduras, where it provided near perfect protection against the ravages of Hurricane Mitch in 1998. Some of these stories have been documented and can be found at: <http://www.vetiver.org>. The website also contains reports from other parts of the world, and information on practical guides such as:

- Training manual of the international training course on the vetiver system. Hard copies of the training manual are available from The Royal Projects Development Board. To obtain a copy email your name and address to Suwana Pasiri. <pasiri@mail.rdpb.go.th>
- Vetiver grass - a hedge against erosion. The Vetiver Network (TVN) has published a revised (fourth) edition of this book - commonly called the Green Book. Copies available from TVN.

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research policies favoured Green Revolution technologies rather than SARD. Although NGOs had been instrumental in establishing SARD alternatives, if SARD was to scale out nationally, and scale up institutionally, proactive national policies were required to push it beyond the NGOs local 'micro-project' sphere of influence.

### Sharing of results

Findings from these workshops were synthesised and presented by the participants at national meetings in the capital cities of Honduras, Guatemala and Nicaragua. Key actors in government, relief, development and research institutions were invited. Farmers and technicians presented their findings; the national research coordinators, the methodologist and the principal investigator gave their reports. In-country researchers in agricultural economics and disaster prevention gave topical presentations. Notable figures such as Nobel Prize winner Rigoberta Menchu, several government ministers, and representatives from the United Nations gave keynote addresses. A video of the research project (see below) was shown and distributed.

### Potential of SARD demonstrated

The Campesino a Campesino Movement in Central America has demonstrated the social, environmental and agricultural advantages not only of SARD, but also of farmer-led approaches to sustainable agriculture. The study itself demonstrates the tremendous potential for research and development within farmers' movements. While farmer-promoters within the Campesino a Campesino Movement have carried out on-farm experiments and have shared their knowledge across borders for thirty years, this was the first time ever that farmers had collaborated on a regional research project. Participants have expressed their desire to establish national and regional farmer research networks to continue their agroecological research.

### Limited impact on national policies

A year after the study, the participating organisations from Nicaragua met to assess the impact of their research. Most organisations reported widespread adoption of agroecological practices at the project level by conventional farmers who had participated in the study or had heard of the findings. A number of NGOs had successfully used the study to persuade international funding institutions to support their efforts at sustainable reconstruction. Some participants were members of territorial committees and used the study to argue for sustainable reconstruction at the

municipal level. One organisation gave a workshop on sustainable, participatory reconstruction to donors in Europe, and used the study as an example of the human capabilities in Central America.

This trend of local and territorial impact appears to have been repeated in Honduras and Guatemala. Unfortunately, the study does not seem to have had much of an impact on national reconstruction policy in any of the three countries. While there is evidence of receptivity to the sustainable approach by the government of Honduras, Mitch seems to have been forgotten in Guatemala. Official Nicaraguan reconstruction efforts have been plagued with political difficulties, with the government focusing on large-scale infrastructure projects designed to support tourism and conventional agricultural exports rather than sustainable agriculture. Efforts by NGO networks to influence national policy have not met with much success, with or without the study.

### Public pressure needed

The Mitch study has uncovered a conspicuous 'policy ceiling' in sustainable agricultural development. While NGOs and the Campesino a Campesino Movement have been instrumental in developing the technical

and methodological aspects of sustainable agriculture in Central America, they are limited in their ability to influence the policy context. Lack of a favourable *policy context*, and the lack of political will on the part of national governments to create one, appears to be holding back grassroots efforts at scaling up sustainable agriculture. The next task confronting sustainable agricultural development may be to translate farmer-to-farmer successes on the ground into the broad-based, public pressure needed to influence national policy-makers. ■

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### For more information

- World Neighbors. 2000. **Reasons for resiliency: toward a sustainable recovery after Hurricane Mitch**, and accompanying video, **Changing course: recovery & research after Hurricane Mitch**. Both can be ordered on-line through the World Neighbors' web site (<http://www.wn.org>); by sending an e-mail to [order@wn.org](mailto:order@wn.org); or by writing, calling or faxing World Neighbors, 4127 NW 122nd Street, Oklahoma City, OK 73120 USA; phone: +1 405 752-9700; fax: +1 405 752-9393. See also page 30.

*Participants enthusiastically claimed that the study had been a highly successful learning experience*



Photo: World Neighbors

# Reducing food poverty with sustainable agriculture: new evidence

In 1998 the SAFE-World project started to audit recent worldwide progress towards sustainable agriculture. A survey of sustainable agriculture initiatives was conducted with the aim of investigating both processes and outcome, and to draw conclusions on whether such improvements could significantly help to feed the growing world population without causing further damage to environment and human health. At the end of 2000, the database contained information on 208 cases from 52 countries involving some 8.98 million farmers on 28.92 million hectares. On this basis it is estimated that on at least 3 % of the farmed land in Asia, Africa and Latin America, farmers are using sustainable agricultural technologies. A summary of the conclusions of the survey has been published on the web, and a book to be launched soon. The following are excerpts from this summary.

## Types of improvement for sustainable agriculture

- 1: Better use of locally available natural resources – in 88% of the cases
- 2: Intensified use of microenvironments in farm systems (gardens, orchards, ponds) – 21%
- 3: Diversification by adding new regenerative components – 59%
- 4: Better use of non-renewable inputs and external technologies – 18 %
- 5: Social and participatory processes leading to group action - 55%
- 6: Human capital building through continuous learning programmes – 92%
- 7: Access to affordable finance (credit, grants, subsidies) – 17%
- 8: Adding value through processing to reduce losses and increase returns – 12%
- 9: Adding value through direct or organised marketing to consumers – 15%

## Achievements

Of the 208 cases, 91 contain data on yield changes obtained by improvements as presented in the box. The proportional yield increases are generally: 50 – 100% for rain fed crops, though considerably greater in a few cases; 5 – 10% for irrigated crops, though starting from a higher absolute yield base.

Most initiatives report significant increases in household food production – some as yield improvements, and some as increases in cropping intensity or diversity of produce. The evidence shows that:

1. For 4.42 million farmers on 3.58 million ha., average food production per household increased by 1.71 tonnes (an increase of 73%).
2. For 146,000 farmers on 542,000 ha cultivating root crops (potato, sweet potato and cassava), the increase in food production per household was 17 tonnes (an increase of 150%).
3. For the larger farmers in Latin America (av. size = 90 ha/farm), total production increased by 150 tonnes per household (an increase of 46%).

## Conducive factors

The successes have been mainly founded on:

- Appropriate technology adapted by farmers' experimentation;
- Social learning and participatory approaches;
- Good linkages between farmers and external agencies, together with the existence of working partnerships between agencies;
- Presence of social capital at local level.

It is concluded that if sustainable agriculture is to spread to larger numbers of farmers and communities, then future attention needs to be focused on:

1. Ensuring the policy environment is enabling rather than disabling
2. Investing in infrastructure for markets, transport and communications;
3. Ensuring the support of government agencies, in particular, for local sustainable agricultural initiatives;
4. Developing social capital within rural communities and between external agencies.

## Proud portraits

Both the website and the publication present an impressive list of proud portraits of sustainable agriculture. Two examples:

Most initiatives seek both to reduce soil erosion and to make improvements in soil physical structure, organic matter content, water holding capacity and nutrient balances. One sustainable agriculture technology to spread at extraordinary speed is zero- or minimal tillage (ZT). For example, in Brazil, there were 1 million ha. under ZT in 1991; by 1999, this had grown to about 11 million ha. in three southern states only. ZT has resulted in better input use, water retention, soil management, diverse rotations, break crops for weed control (e.g. ray and black oats between

maize/soybeans) and use of green manure and cover crops. ZT also cuts erosion and water run-off, thus reducing water pollution.

Many sustainable agricultural initiatives have reported very large reductions in pesticide use following the adoption of IPM through farmer field schools in rice agroecosystems.

In Kenya, about 2000 farmers have adopted 'push-pull' strategies developed by ICIPE to repel (push) stem borers from the cereal crop (maize and sorghum) using a repellent intercrop (e.g. molasses grass (*Melinis minutiflora*) and silver leaf (*Desmodium uncinatum*)) and to attract (pull) them to intercrop or barrier forage grasses e.g. Napier grass (*Pennisetum purpureum*) or Sudan grass (*Sorghum vulgare*). In this way maize yields have improved by 60 – 70 % in 1998-99. ICIPE has also found that intercropping maize with the fodder legumes silver leaf and green leaf (*Desmodium intortum*) reduced infestation of the parasitic weed, *Striga hermonthica*, by a factor of 40 compared to maize monocropping. This is significantly more than intercropping maize with soybean, sunhemp and cowpea.

## Supportive policies are missing

The past decade has seen considerable global recognition of the need for policies to support sustainable agriculture. In most countries, however, sustainable agricultural policies remain marginal. The collected evidence shows that sustainable agricultural systems can be both economically, environmentally and socially viable, and contribute positively to local livelihoods. But without appropriate policy support, they are likely to remain localised in extent.

**From:** Pretty J and Hine R. 2001. **Reducing Food Poverty with Sustainable Agriculture: A Summary of New Evidence.** Final Report from the SAFE-World Research Project, Feb 2001. University of Essex, Colchester, UK. A summary of the report is available on <http://www2.essex.ac.uk/ces/ResearchProgrammes/SAFEW47casessusag.htm>

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## Supporting community seed multiplication

# The 'Rescue from the Pot' project

Ivan Kent and Samuel P. Mokuwa

After a decade of civil war, access to a sufficient diversity of seed material is difficult for the small-scale rice farmers of **Sierra Leone**. Valuable stocks have been destroyed, and the disruption of national, regional and community level trading networks has hampered the spread of new technologies and their adaptations. After many years of attempts to provide planting material through emergency large scale aid distributions, there is now a need for a more subtle approach to support the recovery of local seed stocks and the social networks upon which they depend. With these aims in mind, the 'Rescue from the Pot' project, a joint initiative between local communities and the international NGO, Action Against Hunger, was started in March 2000, in the Southern Province of Sierra Leone, an area recovering from conflict.



Photo: Ivan Kent

*Rice seed in Sierra Leone: many varieties are usually found within the same family farm*

### Rice cultivation in the forest zone

Rice cultivation within the forest-zone of Sierra Leone takes place in a variety of ecological conditions, with upland and swamp environments often found within the same farm (Richards 1986). Farmers often plant several varieties of rice to match a range of soil and moisture conditions. The use of varied environments and cultivars of different cycle lengths allows the harvest to be spread over several months, thus reducing bottlenecks in labour and providing a variety of grains for the household, community and market. Although formal seed markets play an important role in the distribution of the more popular and widespread varieties, many landraces are distributed through informal channels and social networks.

### Seed stocks lost due to conflict

Since the beginning of the civil war in 1991, almost all parts of the country have at one time or another suffered conflict or brutal rule by armed factions. Where fighting takes place, stocks of rice seed are lost as a result of looting, extortion and arson; markets and social mechanisms for exchanging seed are invariably disrupted. Maintaining access to particular varieties becomes difficult, especially when traditional source areas become 'off-limits' as a result of on-going conflict. In addition, continuing food insecurity means that seed stocks are often used for consumption.

### Emergency distributions

External interventions in the agricultural sector in Sierra Leone, as in other war-torn countries, have been largely based on the delivery of seeds and tools. Dealing with tens of thousands of farming families, these operations provide basic, standardised inputs during the planting season in an attempt to replace lost quantities of seed and to prevent further population displacement or long term dependency on food aid.

Due to their sheer size and logistical requirements, it is not possible for these operations to take into account the agro-ecological diversity of each area, or the varied preferences occurring at the village or farm level. In Sierra Leone, programmes are therefore limited to the distribution of a few improved types, notably Rok3, a popular variety developed at the national Rice Research Station at Rokupr, tolerant to both swamp and upland conditions.

The versatility of such varieties make them a good option for large-scale emergency operations aimed at meeting immediate shortages of seed. However, aid agencies face difficulties in sourcing enough seed of sufficiently high quality, and repeated distributions of the same variety over several years do little to encourage the multiplication of more locally adapted and preferred landraces.

### Cherished landraces

Three chiefdoms in the Southern Province of Sierra Leone were selected for the pilot phase of the project. After two years largely free of conflict, much of the population that had earlier fled had since returned home. While Rok3 and a handful of popular local landraces were generally available to most farmers, many 'cherished' landraces, suitable for particular ecological niches or cultural functions, were hard to come by.

However, some local landraces could still be found; a survey of 105 farmers carried out in three villages after the 1999/2000 harvest revealed that 16 rice varieties with distinct names were being used. Unfortunately, many of the sought-after or 'cherished' varieties were held only in small amounts by a few families and remained inaccessible to the majority of farmers. Furthermore, because of the still precarious food security situation, little of the cherished seed was saved for the next season. While it was recognised that the resources for multiplying the seed could be found locally, the disruption of social networks caused by the war meant that mechanisms for widening access to seed were missing. In response, chiefdom authorities decided to work with Action Against Hunger in order to rescue some of these cherished varieties.



### Preferred characteristics

Once the outline of the project had been agreed upon, meetings were held to draw up lists of the most sought after seed. Through a system of matrix ranking, which included gastronomic as well as agronomic criteria (see box), several varieties were prioritised by each chiefdom. It was agreed that the varieties targeted for multiplication would be limited to those that were highly valued, but in short supply. The three chiefdoms involved in the project selected different varieties for multiplication, reflecting local preferences and varying degrees of scarcity.

### Rescued for multiplication

The next stage of the project was to locate the cherished varieties within the community so that they could be 'rescued' for multiplication. It was agreed that cherished seed could be exchanged at a set ratio of 3:2 for a more common variety provided by Action Against Hunger, at designated trading points throughout the project area. Rice was 'exchanged' rather than bought for cash, in order to maintain the food security of households giving up their cherished varieties. At first, farmers were slow to come forward with their rice. However, after 2 weeks, a total of 6.5 metric tonnes of seeds had been exchanged for 9.8 metric tonnes of Rok3 seeds donated by Action Against Hunger.

Labour groups were then invited to grow the cherished varieties on behalf of the community. An agreement was collectively developed and signed by the group leader and master farmer in each group, and witnessed by the Paramount

or Regent Chief - the chief custodian of land. A total of 42 labour groups, each with up to 25 members, were formed to multiply the cherished seed in the three chiefdoms. They were paid for their labour with food, and allocated a small percentage of the harvest. During the growing period, field extension officers and community counterparts made farm visits to monitor progress and estimate potential yield. In addition, regular village meetings provided an opportunity for group leaders to give updates on their progress to the chiefs.

### Project not without difficulties

At the seed exchange stage, some field extension officers were unable to identify the 'cherished' varieties and some farmers donated and received the wrong type of seed. In one area, seed earmarked for multiplication was eaten on the order of the town chief during a village construction project, and in another the project was suspended indefinitely because armed militia looted the food stocks reserved for the workgroups multiplying the seed. Not all parties agreed on who should benefit from the scheme; displaced populations were not always able to take part in the project, since chiefdom authorities sometimes limited participation to long-term residents. Despite these difficulties, it is estimated that 35.5 metric tonnes of 'cherished' seed were made available to the wider community by the end of the first harvest.

### Many lessons learned

The 'Rescue from the Pot' project illustrates the potential for incorporating local knowledge and capacities into the more common distribution-oriented seed programmes of aid agencies. But the

transition from emergency seed distribution to community-based seed multiplication requires a set of new skills and a different mode of engagement between local communities and implementing agencies. Extension staff require more locally adapted skills (in both agronomy and conflict resolution); while farmers can benefit from training in seed multiplication and storage to produce good quality material. More importantly, regular contact between all parties is essential to nurture mutual trust and activities such as football matches and music events, as well as seed fairs and formal meetings can play an important role.

In an unstable post-conflict environment, communities are wary of investing in longer-term collaborations with aid agencies that may leave an area suddenly if fighting resumes or funding dries up. But frequent meetings with all actors help to enhance a sense of ownership as well as to re-establish traditional civilian structures disrupted by conflict. Although still in its early stages, farmers in the project area already have access to a broader range of seed types and even after a single season requests have been made for an extension of the 'Rescue from the Pot' project into the following year.

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### Reference

- Richards P, 1986. **Coping with hunger: hazard and experiment in an African rice farming system**. Boston, Allen and Unwin.

### Characteristics of preferred varieties

- high tillering ability & large panicle formation
- adaptability to various soil conditions
- high yields
- tolerance / resistance to iron toxicity (for swamp varieties)
- good performance on short fallow bush
- quick maturity (thus shortening the 'hunger-gap')
- palatability
- high swelling during cooking
- attractive grain colour (red or brown pigmentation is preferred in local dishes);
- good storage after cooking



*Luseni Cafenor - one of the project farmers with a field having a cherished variety 'rescued from the pot'.*

# Survival to Sustainability : Pragathi Mahila Samakhya's case

Y Ramesh and Y D Naidu

## Background

Ananthapur district is known for frequent droughts due to irregular rainfall patterns. Gandlapenta is one of the most dry mandals in the District. Groundnut is grown in 85% of dry lands. Due to continuous monocropping, groundnut crop has become vulnerable to attacks of pests & diseases. Yields were declining. In 1996 and 1997 there was severe drought and farmers lost virtually all the seeds. The Government declared 1997 as drought year and released 90 crore rupees for crop losses and 40 crores for crop insurance.

MYRADA, well known for social organisation, started working in Kadiri in 1982. Myrada's focus is on wasteland development, resettlement of landless poor and participatory watershed development. Beginning as a society working with individual landless, Myrada was involved in formation of men and women Self Help Groups (1982-89). On request of MYRADA, a committee initiated Participatory Technology Development with one SHG. They tried out LEISA technologies for improving groundnut production.

Meanwhile, Women's Self Help Groups gathered momentum. A Federation of Self Help Groups - Pragathi Mahila Samakhya - was formed with the support of UNDP & MYRADA. The total membership of this federation rose to 2250 women.

## 1998: PTD in Groundnuts... Problem common... Approach different

Women-farmers, who took-up groundnut experiments, expressed their difficulty in getting groundnut seed. In the Samakhya meeting, they realised that it is a common problem for all members. They wanted to tackle the issue collectively.

## Women force... on the move

They decided to meet the district collector. MYRADA staff supported them but stood behind to watch how they would articulate their problem. Women farmers waited patiently in front of the collector's office till evening refusing to go back without meeting



Photo: S Jayaraj

him. Finally, when they met him, they explained their problem and requested him to attend Samakhya general body meeting. The collector was prepared to give them that much time.

During the course of the meeting they gave a brief report of Samakhya activities and specified the quantity of seed required to meet the demand of 1800 SHG members. The collector promised to help them. Then, he asked them a straight question: "What can you contribute"? Immediately, on that day itself, they discussed and decided to give Rs. 1000/- as individual share. To collect Rs. 1000/- within five days, they mortgaged their ear rings, sold goats, sheep, pulses and grains kept for house

consumption. Within five days, the women remitted Rs. 7,25,000 into their collective account as assurance for repayment of seeds. The collector was pleasantly surprised. Also, they drew money from sangha account. They took the cash to the bank.

The bank was buzzing with activity and was open till 8 p.m.! (counting the cash deposits).

Samakhya obtained the License for procurement of seed and fertilisers from the Joint Director of Agriculture, Ananthapur. The district authorities immediately directed the APSSDC to release 3626 bags of Groundnut (30 Kg's). UNDP also came forward to support this effort by providing Rs.9,67,000 as seed



Photo: S Jayaraj

capital to Samakhya. The first hurdle was overcome.

### Resilience under test again...

Samakhya received stock and stored it in the mandal storage area. Seed loads came from Cuddapah, Baddivelu, Kurnool, Nellore and Gujarat. When the police officials were approached to help them for safeguarding the stock, they were told that men should not be allowed inside the campus. Thus, Women were forced to stay there day and night for nine days, receiving loads, signing trip records and distributing seeds. Five groundnut bags were distributed to each member to cover an extent of two acres. Each member had to repay the amount received i.e. Rs 1,300/- plus interest within seven instalments to Samakhya. The members worked out an easy repayment schedule. The second hurdle was overcome.

### Weather fails...increased pressure of loans

Unfortunately rain god didn't bless them after sowing all seeds. There was pressure inside the family and from Samakhya for loan repayment. Husbands and elders started telling the women 'since you have got loans you repay it'. Women had to go to the neighbouring villages, making announcements regarding who has not paid, while beating drums. Strongly committed to repaying the loan amount, everybody managed to repay it within seven months. They succeeded again.

### 1999-2000

#### Spiralling inspiration

Meanwhile, The PTD experiments continued. Twelve women and ten men farmers who have taken up seed trials supported by ame shared their experiences with several hundreds of farmers during a **Farmers' Day**. More women farmers took up groundnut production for multiplication of those seed varieties which performed well in the trials.

### Policy advocacy to seat of knowledge...

Pragathi Mahila Samakhya became a platform for sharing information and knowledge. Many SHG's came to understand the potential of Low External Inputs for Sustainable Agriculture (LEISA). ame conducted trainings for the functionaries of the federation. They trained members of 45 SHG's and their families in LEISA technologies.

After this Samakhya formation, farmers started thinking in depth about problems related to agriculture. ame has

introduced the following technologies: *seed treatment with Rhizobium, Trichoderma and Chloropyriphos and Gypsum application after second weeding.* PTD farmers got convinced with the importance and usefulness of technologies. They observed: *Increase in seed germination rate; Increase in number of pods and its weight; Control of pests like white grub; Control of Tikka disease; Increase in foliage development and control of early leaf fall*

In general, farmers have observed an increase in the yield approximately from four bags to 10 bags compared to non PTD farmers. *Initially, when PTD farmers were bringing gypsum, fellow farmers mocked at them saying that they were applying Rangoli powder to field but after observing the effect of it, they are requesting these farmers to get gypsum for them. Left over gypsum was sold to these farmers at a higher price and money was put in Sangha account. One lady has sold these inputs at the rate of Rs 400 to non - PTD Farmers.*

### Meanwhile, resources build up...

During Kharif in 1999, Samakhya has collected Rs 4,50,000 from 500 members as their contribution and it has given matching amount of Rs 4,50,000 to adjacent Samakhya promoted by UNDP. The Samakhya has entered into an agreement with Ted Turner

Foundation (TTF) and received Rs 37.55 lakh as seed capital to support SHG's through VO's.

### 2001: From Single Crop to Integrated Farming Systems

In Ananthapur District alone, area under groundnut has come down from eight lakh hectare in 1996 to around 6,50,000 in 2000. The systemic influences are: GATT policies, market rate fluctuations, continuous drought, decrease in soil fertility under groundnut etc. However, with increasing confidence, the women farmers are adopting LEISA technologies and deciding to inter-crop Groundnut with Pigeon Pea and Bajra (Pearl millet). From a single crop they want to move towards integrated farming systems.

The future is bright for the Samakhya. They are determined to expand their activities. They stand as a model for gender empowerment.

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## Life on the Edge:

***Sustaining Agriculture and Community Resources in Fragile Environments*** by N S Jodha, Oxford University Press.

ISBN 019565134-0. Rs. 595/-

*This collection of essays deals with natural resource use and its effects on environmentally fragile mountain regions and dry tropical areas.*

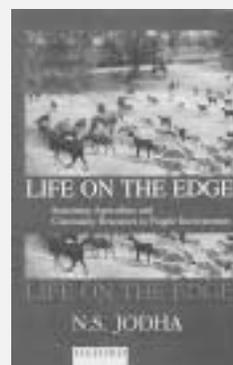
*The themes covered include famine, food security, agriculture sustainability in fragile areas, common property resources, and traditional systems of natural resource management. These essays.*

- emphasize the urgent need for long term sustainable management of agriculture, environmental and natural resources
- examine the viability of community-based resource management initiatives.
- are based on micro-level empirical evidences from several areas

*Jodha's work has had far-reaching impact on decision-making concerned with the development of fringe areas and their inhabitants, and has been extensively used in development research.*

*With a foreword by Partha Dasgupta, this volume is a significant scholarly debate in the fields of agrarian economics, human ecology, and sustainability. It complements the insights generated through the approaches of rural economists, sociologists and anthropologists.*

*The book is a valuable source for policy makers, researchers, NGO's, Donor agencies, and activists.*



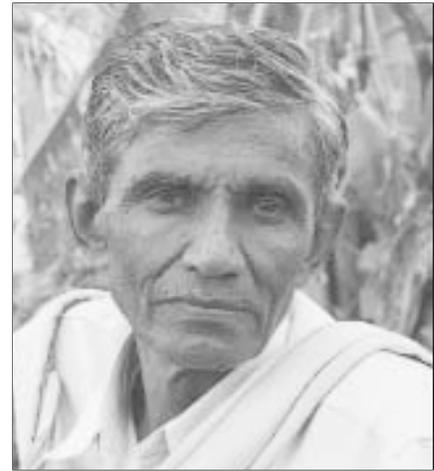
# Droughts are not a new phenomenon...

**D**roughts are not new to our country. My grandmother used to tell me stories (in fact what she had witnessed) when I was a child (1940 - 1945) about how severe droughts were during 1900 - 1910. She told me about instances where people killed other people just to sip something from their stomachs and intestines. But, nowadays, if the monsoons are delayed even by ten days, the politicians, the media and even the rural population make a big noise about cattle and people not having water for drinking, fodder and food. It is good for the government and the people to know about the problem but false propaganda about cattle and people starving and dying does not serve any purpose. During July-August 2001 there were disturbing stories in the newspapers that farmers in Bidar District had let out cattle with boards hanging around their necks saying that any one could adopt them. Some of my friends from Bangalore went there to find such cattle and arrange for their well-being, but to their surprise they did not find any such cattle in the whole of Bidar district. They found that few people were finding it difficult to feed them regularly. This is just an example of things being exaggerated in the media and by the politicians.

In tropical countries, droughts occur frequently. In olden days it was common in our country for droughts to occur every 5 or 6 years. The farmers made it a practice to have fodder and food grains (particularly coarse grains like ragi, bajra and other such millets that could be stored for longer period easily) stored for atleast two future years which could be used in times of distress. Unfortunately, these days farmers have given up cultivating crops that provide fodder and food, instead, they are growing commercial crops like cotton, sugarcane, tobacco, flowers and the like which are neither fodder nor food. Adding to the problem of population growth and collapse of the joint family system, large areas of pastures and community grazing lands have been converted into residential sites. In the

name of industrial development, huge areas of agricultural lands have been taken away for construction purposes. Grains, which were supposed to be food for people, are being converted as livestock feed in huge quantities. Because the society and the government are encouraging production and sale of liquor in a big way, the working class and the small farmers have lost their purchasing power and the public distribution system adopted by the government does nothing to ensure that people get their food.

In the olden days, people in rural areas used to build ponds and protect them to overcome problems of water scarcity during times of distress. But these days since such programmes have been taken over the government without the involvement of the local people and through an outside contractor backed by a local politician, such structures are being neglected without maintenance. I very well remember that some well-off farmers used to build water tubs and fill them regularly for the benefit of the cattle and animals. Each village had divine forests and sacred trees like pipal and neem in abundance. They were



protected but during drought periods, the needy farmers were allowed to collect a limited amount of fodder as per his allotment by the village committee for which he was assigned to plant more such trees that could provide fodder in the future.

Rich farmers used to organise gruel camps for 100 to 150 days for thousands of needy people either together or individually, so that no one was to starve. People knew all about wild tubers and palms that could be used as food. It was the concern for the needy people in the olden days unlike the selfishness and lavishness of many in these days, that has created a situation where both cattle and people are feeling the pangs of poverty during drought which otherwise is a common feature in our country.

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Photo: S Jayaraj



Mrs Madondo, an AIDS widow, with her children and grandchildren surrounded by their weedy conventional cotton. Shortage of labour is a serious constraint for widows.

Photo: Resson Hlodzi

# Organic cotton to mitigate the impact of HIV/AIDS

Sam Page

**Z**imbabwe has one of the highest HIV infection rates in the world, with more than 26% of the sexually active population living with HIV. The driving force of this epidemic is poverty - it is forcing men to leave their families for extended periods in search of work and women to indulge in prostitution to raise money to feed their children. Local non-government and community-based organisations are at the forefront of the struggle against this pandemic.

In 1995, at the request of some 40 women farmers who could not afford to buy pesticides, Zimbabwe's first organic cotton project was set up in the Lower Guruve area. This initiative has since grown into a larger project, the Zambezi Valley Organic Cotton project, supported by the NGO African Farmers' Organic Research and Training (AFFOResT). Organic cotton and groundnuts are being produced for sale on the local and overseas markets.

The project is addressing a group of farmers who have been largely marginalised as a result of traditional law and agricultural policies: widows, many of them AIDS widows. Although many of these women may be HIV positive, it is the older women who are likely to be safe from HIV infection. As such, some older AIDS widows are responsible for six or more children, ranging from toddlers to teenagers. Many such widows are struggling to survive as smallholder farmers. While in

the past widows involved in farming were a relatively small group, today, AIDS widows free of HIV and over the age of 40 are likely to be among the most productive farmers in Zimbabwe.

## The impact of HIV/AIDS

The Lower Guruve area of the Zambezi Valley has not escaped the ravages of HIV/AIDS. Already more than one third of the families are headed by widows and there are an estimated 7,000 orphans living in the area. Child-headed households are also emerging. An initial HIV/AIDS impact assessment by the project has found that AIDS widows in particular suffer the effects of increased poverty, reduced availability of labour and the inability to make important management decisions. Interviews with a number of widows revealed the following adverse consequences of HIV/AIDS:

### Shortage of labour

Widows suffer from a shortage of labour. Yields of the main crops cotton, maize and groundnuts are generally reduced due to late planting, smaller areas planted and poor management. Weeding seems to be the activity that suffers most. One of the women interviewed said: *"The farm activity most affected is weeding and we were delayed in picking cotton. It's impossible for me to go to the field, and it won't be possible next season either, or until the illness of my husband goes away. No one has relieved me since he got ill."* Another woman

commented: *"There's only me, my 12-year-old son and my mother-in-law who work on the land now. When my husband was alive, we would plough one acre in a day, but now we can only manage to plough half an acre"*.

### Shortage of cash

Shortage of cash is usually a consequence of the loss of income from either full-time employment in town or sources supplementary to farming, such as ploughing, thatching, carpentry, building or mechanical work. One woman said: *"When my husband was alive, I had my small project of making table mats, but now I can't afford the money to buy the thread"*. She also had to reduce her acreage of cotton. In the 1997-1998 season, she planted five acres of cotton, whereas in 1994-1995 she and her husband had grown seven acres of conventional cotton. *"When I returned to the Valley I had difficulty in finding the money to buy seed and pesticides. So, I milked my cattle and sold the milk to buy seeds."* Another woman also suffered from a lack of money to grow her cotton. She had to sell an ox to buy the cottonseed and also to pay for her children's school fees and to buy food.

### Lack of financial and management skills

This is a particularly acute problem in households where the deceased husband traditionally made all the important financial and farm management decisions. One woman, for example, mentioned that a cheque they had received from the Cotton company was made payable to her husband, who was unable to travel in order to cash it.

### FFSs as support mechanism

Conventional smallholder cotton growing in the Zambezi Valley is usually based on monocropping and the use of five different pyrethroid and organophosphate pesticides. The current cost of these inputs is US\$48 per hectare. In Zimbabwe, Farmer Field Schools (FFSs) were introduced in smallholder communal agricultural areas as a means of improving agricultural management practices, including the reduction or elimination of costly external inputs. These FFSs were adapted by AFFOResT to promote organic agricultural production.

Up to 90 farmers, many of them women, were trained by AfFOResT as Farmer Field Workers (FFWs) to facilitate FFSs for more than 900 other farmers over three years. During one month, these FFWs were trained at the Eco-Lab, just outside Harare (see ILEIA Newsletter Vol.13, No.4, pp12-13), in Natural Pest Management (NPM) and internationally certifiable organic agriculture, using a process known as *learning through discovery*. Once they had returned, each FFW held FFSs with 10 other farmers, at weekly intervals, throughout the growing season. Field staff regularly followed up this process to provide motivation and support. The project also managed to conduct *farmer participatory research* (FPR). In this system of research, innovative farmers were encouraged to generate their own research questions, while project scientists gave guidance in experimental design, including data collection and analysis, in a way that ensured that the farmers retain ownership of the results.

The AIDS widows said that they attended the FFSs because they gained strength from the support of other farmers and learnt how to grow cotton, hitherto regarded as a *man's crop*. They said that the system of intercropping and underplanting with food crops such as sorghum, sweet potato, cowpea and water melon, which had been introduced to eliminate the need for pesticides, also suppressed weeds, increased income and improved food security. In time they noticed that soil fertility was enhanced by following the project's recommendations for growing of live fences, conservation of leguminous trees in fields and rotation with groundnut and sunhemp.

### Results compared

An analysis of costs and benefits during the 1997-1998 season indicated that organic cotton farmers had higher profits compared to conventional cotton growers. Although the average organic cotton yield was less than half that of the conventional crop in 1998, it gradually improved towards three-quarters of conventional yields by the year 2000. Year by year organic farmers gained a

*Mrs Wingwiri and her son scouting their organic cotton crop. It is intercropped with sorghum, cowpea, pumpkins and sunhemp to increase diversity and improve food security.*



Photo: Resson Hodzi

consistently bigger profit (see table). In 1998 and 1999, the farmers who had been certified as *organic* by the Eco-Certification Inspector received an additional 20% premium from the buyer.

It was estimated that the labour requirement was considerably reduced by replacing the 15 hours normally spent doing tasks associated with applying pesticides to conventional cotton, with 2 hours for attending a FFS and one hour scouting for pests and *farmers' friends* such as predators and parasitoids.

One widow indicated: *"I will grow only organic cotton next year because of the low labour requirement. There is less labour needed for weeding because some parts of the field are covered by cowpea. Less labour is needed for spraying too because the herbal sprays are made from plants in the bush nearby. I will not do any conventional cotton production because I have no money to buy inputs."*

It was concluded that organic farming systems have proven to be particularly appropriate for households affected by the AIDS pandemic, as they do not require the purchase of external inputs, they have reduced labour costs and they offer the farmers a premium when sold as a certified organic product.

### AIDS prevention

The project has incorporated a component on women's vulnerability to HIV infection and prevention in its FFW training courses. A four-week training of male and female FFWs in May 1999 included two AIDS prevention sessions for men and women. During these

sessions, condoms were promoted and the FFWs were invited to take batches with them to the Zambezi Valley to be sold at a small profit to their friends and families as an income-generating activity. The project is also sensitising communities on HIV prevention with the support of a consultant from the NGO Population Services International, who raises awareness on HIV and Sexually Transmitted Diseases and promotes the use of condoms.

### NGO difficulties in averting HIV/AIDS

Despite its success in terms of mitigating the impact of HIV/AIDS and development of the production of organic cotton, this project is now on the verge of collapse. Since its inception, the biggest constraint has been the lack of funds. Now, the donor has withdrawn and aspects such as local project supervision, allowances for the FFWs, organic inspection and marketing, are suffering. The hard work of the past three years seem to get lost. This has happened despite a strong recommendation by an external evaluator to continue, and the recent nomination of the project by FAO/UNAIDS as a 'best practice' in reducing vulnerability to the AIDS epidemic. This illustrates the difficulties local NGOs have in trying to avert the HIV/AIDS catastrophe. ■

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### Further reading

- FAO 1999. **Sustainable agriculture / rural development and vulnerability to the AIDS epidemic**. UNAIDS best practice collection. UNAIDS, 20 Avenue Appia, 1221 Geneva 27, Switzerland. Fax: +41 22 791 4165, [unaids@unaids.org](mailto:unaids@unaids.org), <http://www.unaids.org/publications/documents/sectors/agriculture/Jc-fao-e.pdf>

- Page SLJ. 1997. **Natural pest management in Zimbabwe**. ILEIA Newsletter Vol.13, No.4, pp.12-13.

**Table: Comparison of Organic and Conventional Cotton in Lower Gुरुve**

Year	Av. Cotton yield	Av. Profit (excluding premium)	Av. Acotton yield	Av. Profit
1998	375 kg/ha	US\$115	1,000 Kg/ha	US\$75
1999	500 Kg/ha	US\$64	1,000 Kg/ha	US\$36
2000	750 Kg/ha	US\$91	1,000 Kg/ha	US\$55

# Contributions

## Combating the consequences of flooding with farmer's innovation and experimentation

by NJ Vermaak and

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The article reports on the devastating floods that occurred in Mozambique and adjacent regions during February 2000. It focuses particularly on the post-disaster period and the adaptations required from farming communities. Subsistence farmers in the Nzhelele region showed considerable potential for restoring their ecological balance by experimenting with new technologies and by taking preventive measures. The flooding disaster re-emphasised the need to avoid overgrazing and to protect natural vegetation. Such measures will improve farmers' resilience and their capacity to recover and sustain their livelihoods.

## Foundation of traditions for drought mitigation with self sustainable agri-horticulture system in arid zone

by Arun K. Sharma, Central Arid Zone Research Institute, Jodhpur – 3242003, India. Email: [aksharma@cazri.raj.nic.in](mailto:aksharma@cazri.raj.nic.in)

After 8 years of experimentation the author developed a highly drought resistant, low-external-input agroforestry system based on Jujube (*Ziziphus mauritiana*) intercropped with annual grain legume crops, mainly green gram (see photo). It takes three years to develop fully but income is generated from the first year.

The system has been found to be sustainable with a rainfall of between 200-400 mm/year, provided the rainwater in the field is conserved and nutrients taken out of the soil with the harvested crop are returned in the form of manure. Experience showed that, on an area of one hectare, the system was able to meet the needs of a family of four that had four goats or sheep.

## How farmers, local NGOs and Government are fighting erosion on the island of Flores, Indonesia

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Photo: AK Sharma

Jujube – green gram agri-horticulture

The mountainous island of Flores is seriously affected by soil erosion. In the article soil conservation programmes carried out since the 1950's are discussed. Planting of contour hedgerows of Lamtoro (*Leucaena Leucocephala*) was very successful until 1986 when a major pest of Lamtoro made its appearance on the island - the psyllid *Heteropsylla cubana*. These jumping lice aggressively destroyed all the established leguminous hedgerows planted over a 20,000-hectare area. The very important lesson learned from this devastating invasion was that large-scale propagation of one exotic species is not to be recommended. The risk of pest outbreaks that cannot be naturally controlled are too high. Presently, a new approach has been developed. This focuses on sustainable agriculture as a whole and not just on erosion control. In this approach 'interception terraces' and the establishment of protective leguminous hedgerows of such species as Turi (*Sesbania sp.*) and Gamal (*Glyricidia sepium*) are promoted. It appears that the farmers and NGOs have found a good and effective way of fighting erosion. However, given the huge area, progress (about 1000 ha in the 1998-1999 rainy season) is still too slow.

## Rebuilding agricultural resilience: broader issues in rehabilitating rural livelihood systems

by Phil O'Keefe, John Kirkby and Andrew Collins, ETC UK, 117, Norfolk Street, North Shields, Tyne and Wear NE30 1NQ, UK. Email: [office@etcuk.demon.co.uk](mailto:office@etcuk.demon.co.uk)

Humanitarian assistance to mitigate natural disasters and, increasingly, complex political emergencies has increased twelve-fold from 1990-96. The challenge is not only to provide relief but to rebuild rural livelihood systems and to restore the resilience of agriculture. This is more easily said than done as the culture of humanitarian intervention is significantly different from participatory development practice. Emergency agriculture is much more developmental than humanitarian. There is a need to i) end the relief phase; ii) encourage restoration of local management of agricultural resources and to restore marketing systems, and iii) to increase resilience by upgrading the quality of inputs, especially improved seed varieties and blood stock lines. Emergency agriculture, to be successful, must capture immediate production opportunity. Humanitarian assistance has become much more professional, not least with the establishment of minimum standards in disaster response. Emergency agriculture, however, is not a part of these standards and remains the forgotten child of humanitarian assistance. Based on existing experiences the basic principles of emergency agriculture have to be thought through. This is what the authors have attempted to do.

The full articles can be requested from the authors or from ILEIA.

## World Bank

<http://www.worldbank.org>

The pages of the World Bank website provide extensive information on disaster management and post-conflict reconstruction. Countries can ask for emergency recovery assistance, and be helped by the bank in financing investment and productive activities. The bank also helps with emergency-preparedness studies and technical assistance on prevention and mitigation measures to strengthen the country's resilience to natural hazards or lessen their impact. The pages are available in several languages, including Spanish and Portuguese. They offer information as well as downloadable reports.

## Relief Web

<http://www.reliefweb.int/>

Relief Web centralises and disseminates information on humanitarian emergencies and natural disasters. This inforchers etc). Its Supplier Guide is an up-to-date and worldwide database of relief products, suppliers and service providers, i.e. you can find a firm, which can supply agricultural tools. Reliefguide provides an online tender area in which aid and development agencies can display their procurement needs. The aim of the Disaster Page is to bring together all parties involved in an ongoing disaster and create an effective exchange of information on aid-related operations and procurement needs. This part is stichers etc). Its Supplier Guide is an up-to-date and worldwide database of relief products, suppliers and service providers, i.e. you can find a firm, which can supply agricultural tools. Reliefguide provides an online tender area in which aid and development agencies can display their procurement needs. The aim of the Disaster Page is to bring together all parties involved in an ongoing disaster and create an effective exchange of information on aid-related operations and procurement needs. This part is still in the pipeline.

## Pacific Disaster Centre

<http://www.pdc.org/>

This Centre is a federal information processing facility that supports emergency managers in the Pacific and Indian Ocean Regions. The page offers information on droughts and rainfall in the region.

## International Decade for Natural Disaster Reduction 1990 – 2000

<http://www.oneworld.org/idndr>

This site provides information on IDNDR, activities, newsletter and an overview of the publications that have been published during the decade. It has been updated in December 1999.

## Asian Disaster Preparedness Centre

<http://www.adpc.ait.ac.th/>

This Asian page on Disaster Reduction for Safer Communities and Sustainable Development provides a lot of information on disaster management, which can also be obtained in printed form. The centre offers courses and training material on disaster preparedness also in regional programmes.



## United Nations High Commission for Refugees (UNHCR)

<http://www.unhcr.ch>

The majority of the world's refugees are found in marginal regions of poor, developing countries. Collecting shelter material and firewood can cause serious deforestation and soil erosion. Natural resources are threatened by the sudden arrival of large numbers of people. UNHCR and partner organisations seek to minimise the environmental impacts of refugee operations. Innovative, alternative solutions are being developed that enable refugee populations to become more closely involved with environmental management and rehabilitation. This site provides important information on refugees and the environment in English and several other languages.

## Humanitarian Practice Network

<http://www.odihpn.org/>

The Humanitarian Practice Network of ODI is a leading information and analysis provider for the humanitarian sector. Its objective is to improve operational practice. The site provides information on this subject.

## Disaster recovery, Iowa State University Extension

<http://www.exnet.iastate.edu/Pages/communications/recovery/>

This site aims to help Iowans make better decisions in tough times. Although tailored for rural families in the U.S.A., the site offers a lot of interesting information on post-disaster agriculture. Practical information, for example on how to manage trees after storm damage and how to store crops, can be very useful to farmers. This site is an example of how the internet can be used in disaster relief and recovery.

## Disaster Preparedness and Emergency Response Association

<http://www.disasters.org/>

Information on emergency preparedness and management of emergency situations is provided

by this website. It is available in English, Spanish, French, Portuguese, Italian and German. Besides information and the Disastercom Newsletter on pdf file, it provides many links to a range of organisations in the field of disaster preparedness.

## Inter-Action-American Council for Voluntary International Action

<http://www.interaction.org/>

The page of the Council provides a lot of information and links. The Disaster Response Committee offers information on emergency response activities and reports on investigated emergency situations.

The sustainable development movement tries to promote dialogue, collaboration and action at project and policy levels on priority development concerns of InterAction members and their Southern partners in reducing poverty and achieving sustainable development. This part of the site offers information and links to organisations on sustainable development and agriculture, and on women in development.

## United Nations Development Programme (UNDP)

<http://www.undp.org>

The page on crisis prevention and recovery gives important information on rehabilitation development initiatives.

The Disaster Management Training Programme DMTP offers country-specific training programmes for national governmental and non-governmental institutions and agencies in various areas of emergency management and disaster mitigation, prevention and preparedness. The DMTP also provides training for in-country UN system Disaster Management Teams. Wherever possible, DMTP provides training within a framework of national capacity building/ strengthening in disaster management programming. Unfortunately, information on agricultural rehabilitation is completely lacking.

## Food and Agriculture Organisation of the United Nations (FAO)

<http://www.fao.org>

On the opening page of this very extensive and interesting web site of FAO is news on important agricultural emergencies like Mad cow disease, Foot and mouth disease, AIDS and climate change. It also gives access to the pages of the FAO agenda, special programmes and focus activities like: agriculture, forestry, sustainable development,

gender and food security, and publications. The web magazine 'Agriculture 21' featured on the web pages on agriculture contains news, spotlights, archives and provides access to all specialised agricultural divisions within FAO. The part on organic agriculture, with downloadable FAO documents, photos, meetings and a discussion forum is of special interest to the LEISA community. The pages are available in English, Spanish and French.

## International Federation of Red Cross and Red Crescent Societies

<http://www.ifrc.org>

This organisation posts news on recent disasters and aid campaigns from all over the world on its site. It contains an interesting article on a training programme in India on disaster preparedness for volunteers from the Indian Red Cross.

# Sustainable agriculture to combat Global Warming

It is now widely acknowledged that the increase in emergencies due to disturbances and change of climate (droughts, floods, hurricanes) is strongly enhanced by 'Global Warming' (IPCC 2001). Global Warming is caused by the emission of 'greenhouse gases' through various human activities such as agriculture.

The 1997 Kyoto Protocol to the United Nations Framework Convention on Climate Change established an international policy context for the reduction of carbon emissions and increases in carbon sinks in order to address this problem. Under the Kyoto Protocol, industrial countries undertook a net reduction of greenhouse gases by 5.2% below 1990 levels by 2012. This implies the need to reduce emissions and increase sinks. Importantly, the Kyoto Clean Development Mechanism also provides incentives – known as 'carbon credits' – for countries that reduce their emissions or increase sinks of greenhouse gases.

In a recent study, Jules Pretty and Andrew Ball analysed the contribution of sustainable agricultural practices to the accumulation of carbon and the additional income this could provide to farmers if 'carbon credits' could be traded as agreed upon in principle in the Kyoto Protocol. The following is excerpted from their report.

### Carbon in agriculture

Agricultural systems can contribute to carbon emissions through several mechanisms: i) the direct use of fossil fuels in farm operations; ii) the indirect use of embodied energy in inputs that are energy-intensive to manufacture (particularly fertilisers); and iii) the cultivation of soils resulting in the loss of woody biomass and soil organic matter. On the other hand, agriculture also can be an accumulator of carbon, when organic matter is accumulated in the soil, or when aboveground woody biomass acts either as a permanent sink or is used as an energy source those substitutes for fossil energy.

Long-term agricultural experiments indicate that soil organic matter and soil carbon are lost during intensive cultivation. But both can be increased to higher levels with 'sustainable management' practices. The greatest dividend comes from conversion of arable to agroforestry systems, as there is a benefit from both increased soil organic matter and the accumulation of above-ground woody biomass.

Grasslands within rotations, zero-tillage (or no-till) farming, green manures, and high

amendments of straw and manures, also lead to substantial carbon accumulation. Zero-tillage with mixed rotations and cover crops can accumulate 0.66-1.3 t C/ha/year. The rates are higher in humid-temperate areas (0.5-1.0 t C/ha/yr), lower in the humid tropics (0.2-0.5 t C/ha/yr), and lowest in the semi-arid tropics (0.1-0.2 t C/ha/yr). For real impacts on climate change to occur, sinks must become permanent. This raises a core challenge for carbon trading systems, as there is no such thing as a permanent sequestered tonne of carbon.

### Income from trading carbon credits?

The first carbon exchange or trading systems have set credit values from US\$1.38 per tonne of carbon, though most commonly in the \$2.50-5.00 range. For the United Kingdom, it is estimated that carbon sequestration could bring arable and grassland farmers between US\$27million and US\$220million per year if the government decided to pay for the ecological services provided by farmers. At current prices, it is clear that farmers are not set to become solely carbon farmers. However, systems accumulating carbon are

also delivering many other public goods, such as improved biodiversity and clean water from watersheds, and policy makers may also seek to price these so as to increase the total payment package. Carbon, therefore, could represent an important new source of income for farmers, as well as helping to encourage farmers to adopt a wide range of sustainable practices.

**From:** Pretty J. and Ball A, 2001. **Agricultural influences on carbon emissions and sequestration: A review of evidence and the emerging trading options.** Centre for Environment and Society Occasional Paper 2001-03, Centre for Environment and Society and Department of Biological Sciences, University of Essex, Wivenhoe Park, Colchester CO4 3SQ, UK. The report can be requested from [jpretty@essex.ac.uk](mailto:jpretty@essex.ac.uk) or downloaded from <http://www2.essex.ac.uk/ces>.

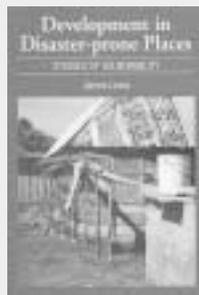
Intergovernmental Panel on **Climate Change (IPCC)**, 2001 **Climate change 2001: Impacts, adaptation and vulnerability.** IPCC Third Assessment Report. IPCC Secretariat, c/o World Meteorological Organisation, Geneva, Switzerland. Can be downloaded from <http://www.ipcc.ch/>.

## Previous issues of LEISA India



**Development at risk? : natural disasters and the third world** by Twigg J (ed.). 1998. 24 p. free of charge. Co-ordination Committee for the International Decade for Natural Disaster Reduction (IDNRD), London, UK / eadesa@raeng.co.uk :The booklet can be downloaded from [www.gfz-potsdam.de/ewc98](http://www.gfz-potsdam.de/ewc98) or [www.oneworld.org/idndr](http://www.oneworld.org/idndr)

This very readable booklet with four important contributions on the relationship of natural disasters and developmental progress is an important basic source of information on the topic. The first two articles look at the scale and nature of the disaster problem. The last two articles deal with ways of overcoming the threat of disasters. Poverty increases vulnerability to natural hazards, and in it the direct connection with development projects. Some people are more at risk than others, which implies that disaster mitigation has to be built on community participation. The booklet carries many examples from all over the world and makes clear why disaster preparedness is worth investing in. (WR)



**Development in disaster-prone places: studies of vulnerability** by Lewis J. 1999. 224 p. ISBN 1 85339 472 6: GBP 15.95. Intermediate Technology Publications, 103-105 Southampton Row, London WC1B 4HH,

UK / [orders@itpubs.org](mailto:orders@itpubs.org)

This book addresses the long overdue imbalance in disaster management: an over-emphasis on post-disaster assistance and a lack of attention to vulnerability reduction. Part one deals with causes for vulnerability in rural areas. In part two a number of case studies (Tonga, Antigua, Sri Lanka, Dorset) help to clarify vulnerability mechanisms. In part three the author offers development strategies for vulnerability reduction and increased disaster preparedness. Recommended reading for all those involved in the issue. (WR)

**From feast to famine: official cures and grassroots remedies to Africa's food crisis** by Rau B. 1990. 213 p. ISBN 0 86232 927 2, Zed Books, 7 Cynthia Street, London N1 9JF, UK.

This book, though not very recent, is still a valuable source on Africa's food crisis. The first part traces the origins of the crisis back to the colonial exploitation of the 19th century. This historical perspective is important to understand why the official cures

discussed in the second part do not work. In the third part of the book, grassroots remedies are discussed. The writer states that 'free enterprise' and 'individual initiative' as important rules for the developed world override local realities and indigenous choices in developing countries. Listening to the people is what the author promotes with this book. He cites several examples of how indigenous agricultural knowledge has helped in coping with crises. (WR)

**Women feed the world: world food day.** 1998. 21 p. Food and Agriculture Organisation of the United Nations (FAO), Via delle Terme di Caracalla, 00100 Rome, Italy / [www.fao.org](http://www.fao.org)

This brochure of FAO was published on the occasion of World Food Day, 16 October 1998. The fundamental contribution of women to household and national food security and the multiple roles rural women play throughout the entire food chain, from agricultural production to post harvest processing and marketing as well as in nutrition and food safety, was the reason for the publication. FAO believes that the battle for food security can be won only if the invaluable contribution made by women is recognised and supported. The document illustrates the important roles women fulfil and highlight the numerous needs they still have to cope with. The conclusion is that rural women must become visible partners in development and that their voice must be heard on par with that of men when policies and plans are elaborated. Yet, a lot has to be changed before this becomes reality. (WR)

**Famine in the Sudan: causes, preparedness and response:** a political, social and economic analysis of the 1998 Bar El Ghazal famine

by Luka Biong Deng. 1999. 124 p. ISBN 1 85864 265 5 GBP 19.95. Institute of Development Studies (IDS), University of Sussex, Falmer, Brighton BN1 9RE, UK / [ids@sussex.ac.uk](mailto:ids@sussex.ac.uk). (IDS Discussion Paper 369).

This IDS paper analyses the causes of the Bahr el Ghazal famine as a chain of political, environmental, economic and social factors, as well as a failure of public action and early warning systems. This detailed study of the causes of a severe famine disaster in 1998 shows the complexity of cause and effect when war, drought and failure of management together disrupt society. Even the international relief response was late and inadequate. The paper throws light on how disasters like this famine could happen, but unfortunately not on how disasters like this can be avoided. (WR)

**Waters of life: perspectives of water harvesting in the Hindu Kush-Himalayas:** proceedings of the regional workshop on local water harvesting for mountain households in the Hindu Kush-Himalayas, Kathmandu, March 14-16, 1999 by Banskota M, Chalise SR. 2000. 101 p. ISBN 92 9115 104 1. International Centre for Integrated Mountain Development (ICIMOD), G.P.O. 3226, Kathmandu, Nepal / [distri@icimod.org.np](mailto:distri@icimod.org.np) / [www.icimod.org.sg](http://www.icimod.org.sg)

This document discusses, through a number of case studies, the methods of harvesting water throughout the HKH mountain region by a wide variety of people groups with special focus on the efforts being made by local communities. The Hindu Kush-Himalayas is the largest storehouse of fresh water in the lower latitudes. It is the source of major river systems, among others the Ganges and the Mekong. The extreme variability of climate and precipitation patterns as well as the inadequate knowledge on the hydrology of the rivers imposes limitations on the development of HKH waters. It concludes that concerted effort is needed to improve existing systems through community participation while expanding new systems at the same time. An annotated bibliography is annexed to the document. (WR)



**Responding to emergencies and fostering development: the dilemmas of humanitarian aid** by Pirotte C, Husson C, Grunewald F (eds). 1999.

183 p. ISBN 1 85649 755 0 (pbk) : GBP 14.95. ZED Books, 7 Cynthia Street, London N1 9JF, UK / [zedbooks@zedbooks.demon.co.uk](mailto:zedbooks@zedbooks.demon.co.uk)

Civil wars, genocide, natural disasters and other emergencies - this book is about how to respond to the fundamental difficulties thrown up by these humanitarian crises. The authors of the book are figures from leading emergency relief and development agencies. They write about their experiences and provide advice on how to act more effectively in the future. The book contains a small chapter on gender and emergency relief. This is an important part because women are often overburdened in crisis situations when they have to be sole providers for their children and families. The book includes many different voices and embodies an open-ended debate about the whole diverse process of international aid. (WR)



**Reasons for resiliency: toward a sustainable recovery after hurricane Mitch.**

2000. 32 p.  
USD 5. -, World Neighbours, 4127 NW 122nd Street,

Oklahoma City, OK 73120-8869, USA / [www.wn.org](http://www.wn.org) (Lessons from the field).

This report presents the results of the study on recovery after Hurricane Mitch in Central America in 1998. It shares the methods and findings of the participatory action research effort undertaken by nearly 2000 farmers in Honduras, Nicaragua and Guatemala. Eric Holt-Giménez's article in this issue focuses on the findings of this study, the conclusions of which are based on the numbers and figures mentioned in the report. This impressive piece of work proves the important possibilities of sustainable agriculture in creating and maintaining a stable ago-ecosystem, especially in disaster prone conditions. The study deserves broad recognition and imitation; at least policy makers in the involved countries should listen carefully. World Neighbours has done an excellent job by publishing the report in English and in Spanish, and making it accessible on the internet (on their web site) for free. (WR)

**Changing course: recovery & research after hurricane Mitch.**

2000. 17 min.  
USD 5.-, World Neighbours, 4127 NW 122nd Street, Oklahoma City, OK 73120-8869, USA / [info@wn.org](mailto:info@wn.org), [www.wn.org](http://www.wn.org)

A video documentary of the above-mentioned research is available both in English and Spanish. Apart from Hurricane Mitch and its disastrous effects, it gives an impression of the field research and the farmers who were involved.

It also illustrates the importance of the conclusions. The message is worth advocating. (WR)

**Making less last longer: informal safety nets in Malawi**

by Devereux S. 1999. 124 p. ISBN 1 85864 286 8 GBP 14.95. Institute of Development Studies (IDS), University of Sussex, Falmer, Brighton BN1 9RE, UK / [ids@sussex.ac.uk](mailto:ids@sussex.ac.uk) : [www.ids.ac.uk/ids](http://www.ids.ac.uk/ids). (IDS Discussion Paper 373).

Informal safety nets are defined in this paper as a subset of the range of coping strategies that people adopt in response to situations of acute food insecurity. Empirical studies across sub-Saharan Africa suggest that traditional practices of 'vertical' redistribution are rapidly

disappearing under processes of commercialisation. Yet, 'horizontal' redistributive practices - transfer to extended family networks and neighbours within poor communities - remain widespread but are highly vulnerable to risks that strike the whole community, i.e. drought. The paper describes studies of household coping strategies in Malawi, which confirm the importance of agricultural labour in rural areas as both a regular source of livelihood and a coping strategy in difficult years. Informal safety nets appear to play a more important role in urban areas than in rural areas, which could probably be attributed to the increased poverty in the latter. The paper ends with recommendations on the design of formal safety nets. The example of aid as inputs-for-work to boost production instead of food-for-work to support consumption is explained and the 'sustainable livelihoods' framework is argued to be usefully applicable to the design of formal networks. (WR)

**Reducing risk: participatory learning activities for disaster mitigation in Southern Africa**

by Astrid von Kotze and Ailsa Holloway. International Federation of Red Cross and Red Crescent Societies, distributed by Oxfam UK, 1996, 301 pp, £14.95, ISBN 0 85598 347 7 .

Despite its focus on Southern Africa, this highly practical training resource can be used in other regions too. It is a collection of participatory learning exercises for people who work with communities at risk.

**Risk-mapping and local capacities: lessons from Mexico and Central America**

by Trujillo M, Ordonez A, Hernandez C. 2000. 160 p. ISBN 0 85598 420 1 USD 18.95. Oxfam GB. (Oxfam Working Papers). Oxfam, c/o BEBC, PO Box 1496, Parkstone, Dorset BH12 3YD, UK / [oxfam@bebc.co.uk](mailto:oxfam@bebc.co.uk)

This paper describes an exercise carried out by Oxfam GB to map out the range of natural hazards and other risks to which people in Mexico and Central America are exposed. It relates the hazards to the complex social, economic, political, and cultural factors that increase the vulnerability of certain social sectors more than others do. The review of the threats and disasters across the region is very impressive. The maps showing the regional patterns of risk and vulnerability help to appreciate the importance of risk management in order to reduce vulnerability and insecurity and achieve sustainable development. The paper states the importance of fostering a culture of disaster preparedness in the different countries

involved, and the importance of community participation in decision making to decrease vulnerability. The paper ends with an important chapter on the needs in disaster management in which warning systems, emergency plans and preparation for protection are discussed. (WR)



**Farming systems approach and post-conflict reconstruction**

by Schelhas B. 1998. 73 p. ISBN 92 5 104152 0; USD 8.00. Food and Agriculture Organisation of the United Nations (FAO), Viale delle Terme di Caracalla, 00100 Rome, Italy / [www.fao.org](http://www.fao.org).

(FAO Farm Systems Management Series 14).

In this document, FAO presents important information on the linkages between the farming systems approach to development (FSD) and post-war rehabilitation and reconstruction. It is based on field experiences in development planning, rehabilitation and relief programmes. The aim of this document is to help small farming households in post-war situations to restore and improve agricultural productivity and levels of living in an equitable and sustainable manner, and strengthen preventive factors to reduce future recurrence of wars. The farming systems approach to development is a participatory approach. It is suitable for developing countries but also for countries undergoing heavy transformation processes like the Soviet Union. As an annexe, the booklet contains the example of the application of FSD in Afghanistan. (WR)

**Roots up, strengthening organisational capacity through guided self-assessment. Revised and expanded edition.**

World Neighbours, 4127 NW 122th Street, Oklahoma City, OK 73129-8869 USA. Fax: +1 405 752 9393; [order@wn.org](mailto:order@wn.org) ; [www.wn.org](http://www.wn.org) , US\$ 20.00 plus postage.

The process presented in the guide provides local development organisations with the tools and perspectives necessary to strengthen their capacity by regularly reflecting on their performance, diagnosing internal strengths and weaknesses, identifying priority capacity areas, and designing action plans to improve effectiveness and long-term viability.

**Manual on participatory 3-dimensional modelling for natural resource management** by Rambaldi G, Callosa J. 2000. 41 p. ISBN 971 8986 21 9.

National Integrated Protected Areas Programme (NIPAP), Protected Areas and Wildlife Bureau (PAWB-DENR), Visayas Avenue, Diliman, 1101 Quezon City, Philippines. (Essentials of Protected Area Management in the Philippines, Vol. 7).

This manual of the Philippines Department of Environment and National Resources (DENR) is intended to assist participatory learning and action practitioners, NGOs, scientific institutions and others, who want to use community-based mapping as a tool for increasing the capacity of local stakeholders to interact with national and international stakeholders, and to express their views and assert their rights. Participatory 3-Dimensional Modelling is a cartographic method which merges Geographic Information System (GIS) generated data with people's knowledge. The manual is a step by step guide to making a relief model of a protected landscape or an ancestral domain in which all stakeholders are involved. The manual is a clear and useful tool, but digital maps and GIS expertise have to be available. This can make the process rather expensive. However, the resulting relief model will be an excellent visual aid for collaborative planning, for collaborative research, for protected area management, for increasing local communications capacity, etc. (WR)



**Agricultural expansion and tropical deforestation: poverty, international trade and land use**

by Barraclough SL, Ghimire KB. 2000. 150

p. ISBN 1 85383 665 6 GBP 14.95. UN Research Institute for social Development (UNRISD). Earthscan Publication, 120 Pentonville Road, London N1 9JN, UK / earthinfo@earthscan.co.uk ; www.earthscan.co.uk

Tropical deforestation has resulted in the conversion of large areas of tropical forest into other land uses. To remedy this degradation of natural resources, the social origins of deforestation processes and their social impacts have to be considered. Deforestation stories that could contribute to the more sustainable use of natural forests have to include the political and socio-economic dimensions, as well as the ecological ones. The writers of this book have tried

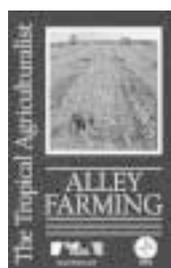
to do just this. They draw empirical data from case studies ranging over three continents. They show that agricultural expansion and international trade are important factors in deforestation, but that their roles are varied and contradictory. The book ends with a look at public policy and institutional reforms at different levels that could help to promote more sustainable uses of tropical forest resources. (WR)

**The dynamics of irrigated rice farming in Mali** by Kater L, et al. 2000. 25 p.

NUTNET programme, International Institute for Environment and Development (IIED), Drylands Programme. (Managing Africa's Soils, ISSN 1560 3520 ; 12). Drylands Programme, IIED, 3 Endsleigh street, London WC1H 0DD, UK / drylands@iied.org / www.iied.org/drylands

This study of the Office du Niger, one of the largest irrigation schemes in sub-Saharan Africa, deals with the maintaining of soil fertility by the rice farmers and the risks of expanding the scheme. The rice farmers have recently diversified their production by growing vegetables on the rice fields in the dry season. They still have to add fertilisers because most of the rice stubble is consumed by livestock. In the dry season the herds browse rice stubble, and in the wet season they graze areas outside the scheme.

Expansion of the scheme will increase the pressure on the remaining resources outside the scheme, woodlands and dryland grazing areas. Sustainability can only be achieved when the rice farmers change their livestock management practices, and try to integrate their livestock and cropping systems. (WR)



**Alley farming** by

Kang BT, Atta-krah AN, Reynolds L. 1999. 120 p. ISBN 0 333 60080 0.

Technical Centre for Agricultural and Rural Co-operation (CTA), PO Box 380, 6700 AJ Wageningen, The Netherlands. (The

tropical agriculturalist / Coste R.(ed.)).

Alley farming, also known as avenue cropping, hedgerow inter-cropping or contour hedgerow system, is an agroforestry land-use system in which food crops are grown in alleys formed by hedgerows of trees and shrubs (preferably of nitrogen-fixing species). A livestock component may be included in the system as the hedgerow foliage can be used as animal feed. As such it is an excellent LEISA alternative in rainfed

areas, particularly on sloping lands, as the hedgerows can greatly reduce soil erosion. Different aspects of this system are dealt with in a concise and practical manner, illustrated with diagrams and photos. This recent addition to CTA's 'The Tropical Agriculturist' series is written by scientists from the International Institute of Tropical Agriculture (IITA), which did research on and promoted the system in Africa. They also ponder over the low adoption rate by African farmers in comparison with Asian-Pacific farmers. (IHG)

**Farmers' knowledge of soil fertility and local management strategies in Tigray, Ethiopia** by Corbeels M, Shiferaw A, Haile M. 2000. 23 p.

NUTNET programme, International Institute for Environment and Development (IIED), Drylands Programme. (Managing Africa's Soils, ISSN 1560 3520 ; 10). Drylands Programme, IIED, 3 Endsleigh street, London WC1H 0DD, UK / drylands@iied.org / www.iied.org/drylands.

In the semi-arid highlands of Tigray, Ethiopia, this survey was carried out to analyse local knowledge on soil fertility and soil fertility management practices. Land shortage and land fragmentation has increasingly forced farmers to abandon fallowing, manuring, terracing and using crop residues. The disappearance of these traditional practices has a considerable impact on soil fertility. One option would be to integrate the livestock and cropping system more closely. Farmers' experimentation with new practices is an important element in learning about integrated soil fertility management. (WR)

**Stakeholder participation in policy processes in Ethiopia** by Tessema W.

2000. 25 p. NUTNET programme, International Institute for Environment and Development (IIED), Drylands Programme. (IIED Managing Africa's Soils, ISSN 1560\_3520 ; 17). Drylands Programme, IIED, 3 Endsleigh street, London WC1H 0DD, UK / drylands@iied.org / www.iied.org/drylands

Degradation of the environment limits agricultural productivity in Ethiopia. Farmers aware of the problem, employ strategies like soil fertility management practices. This study sets out to examine the perceptions held by different people, institutions and agencies of the problems faced by farmers. It tries to identify possible policies and interventions. (WR)

**Participatory integrated pest management** by Weel P (ter), Wulp H (van der).

1999. 67 p. ISBN 90 5328 228 9. The Netherlands Ministry of Foreign Affairs, Development Cooperation, P.O.Box 20061, 2500 EB The Hague. (Policy and best Practice Document 3).

Published in the series Policy and Best Practice Documents, these papers are part of the official policy of the Dutch Ministry for Development Cooperation and provide up-to-date background information on topics that are considered important to the Netherlands development assistance programme. They address practical issues in different fields of development and provide guidelines for implementation. The issues in the field of IPM treated in the publication are of benefit to staff at Netherlands Embassies in developing countries who may be involved in identification, formulation, appraisal or review of IPM and crop protection projects, and preparation of policy or programme documents. Given the target audience, the language is non-technical and practical. New trends in the field of IPM stress the importance of participatory approaches now supported by several prominent international policy documents. In addition, the effective introduction of IPM requires a conducive policy environment that does not encourage the use of pesticides. The paper provides guidelines to support participatory IPM, focussing on assistance in the establishment and development of national IPM programmes; assistance to participatory IPM projects; and incorporation of participatory IPM components in ongoing or future projects or programmes. (WB-from executive summary)

**Co-managing the commons : setting the stage in Mali and Zambia** by

Hilhorst T, Aarnink\_N. 1999. 80 p. ISBN 90 6832 835 2 : NLG 19,50. Royal Tropical Institute (KIT), PO Box 95001, 1090 HA Amsterdam, The Netherlands / kitpress@kit.nl (Bulletins of the Royal Tropical Institute Series ; 346).

Commons are natural resources that are jointly used by various user groups and include forests, lakes, rangelands etc. In many cases the rights of the users are not well defined and a mingling of traditional and modern legal systems create confusion, resulting in overuse and conflict. This publication deals with a form of community-based management called 'co(laborative)-management', offering opportunities for a more sustainable management of common resources by the establishment of formal agreements between user groups and the government. Two case studies are used to illustrate this approach. The first deals with co-management of forest and rangelands in southern Mali, the second with inland fisheries in northern Zambia. The final chapter dwells on the common elements

shared by both cases and ways to facilitate the process of participatory management are explored. (IHG)



**Local forest management in the Sahel : towards a new social contract**

by Kerkhof P ; Foley G, (ed) 2000. 83 p. ISBN 1 901459 28 4. SOS

Sahel International UK, 1 Tolpuddle Street, London N1 0XT, UK / mail@sahel.org.uk

This report, also available in French, is the output of a research project in the Sahel, with emphasis on Mali, Niger and Sudan. It starts with a description of the existing methods of local community management of woodlands and the Sahelian forestry tradition partly imported from 19th century Europe. It describes the woodlands themselves, very different from European forests, and the way Sahelian families utilise the local woodlands in their survival strategies. The main developments in decentralisation and restructuring of the role of the state is described, and the report ends with the conclusion that natural woodlands can only be managed effectively on a voluntary basis by local communities operating within certain agreed constraints and restrictions.

Local management needs to be negotiated between the various stakeholders involved. (WR)

**IPM and the citrus industry in South Africa** by Urquhart P. 1999. 20 p.

International Institute for Environment and Development (IIED), 3 Endsleigh Street, London WC1H 0DD, UK / sustag@iied.org Sustainable Agriculture and Rural Livelihoods Programme (SARL). (IIED Gatekeeper series, ISSN 1357 9258 ; 86).

IPM adoption in citrus is becoming important as part of the international market requirements, esp. in respect to pesticide regulations and criteria of buyers, and the increasing resistance to pesticides. This paper gives a critical overview of the importance of Integrated Pest Management (IPM) for the citrus industry in South Africa in general, and the contribution it can make to rural development in particular. The costs and benefits of IPM adoption for farmers and workers are discussed together with recommendations to encourage the adoption of IPM technologies in citrus at small farmer level. (IHG)

**Meeting the challenges of animal traction : a resource book of the animal traction network for Eastern and Southern Africa** by Starkey P,

Kaumbutho P (ed.) 1999. 326 p.

ISBN 1 85339 483 1. The Animal Traction Network for Eastern and Southern Africa (ATNESA), PO Box BW540, Borrowdale, Harare, Zimbabwe DFID. Intermediate Technology Publications, London.

This book is one of several resource books published by ATNESA after the workshop on

'Meeting the challenges of animal traction' in Kenya in 1995. This particular resource book contains papers that address a number of important challenges to animal traction that relate to participation, environment, gender, extension, transport, equipment and animal husbandry. In addition, several papers describe national-level challenges and project attempts to address them.

In sub Saharan Africa animal traction has been and still is an important way of increasing the surface area cultivated. Animal traction, placed in a comparative frame with hand hoeing and tractors, has many advantages. Though improper use of animal traction can aggravate environmental degradation, the technology is appropriate to agricultural development. The book also pays attention to post-war re-introduction of animal traction. A valuable resource book for all concerned with the development of animal power. (WR)

**A training guide for in situ conservation on-farm : version 1** by

Jarvis DI, et al. (eds) 2000. 159 p. ISBN 92 9043 452 X. International Plant Genetic Resources Institute (IPGRI), Via delle Sette Chiese 42, 00145 Rome, Italy CGIAR.

Agricultural biodiversity maintained on-farm by farmers has become an important way to conserve plant genetic resources in a local environment. This manual is written for Ministries of Agriculture and Environment, Universities, Research and Extension Institutions, NGOs and Community Based Groups. In the past, ex situ conservation programmes have been developed with conservation taking place in genebanks or botanical gardens. This guide provides information on expanding these conservation options to in situ conservation of crops on-farm. It mentions the advantages and disadvantages of in situ conservation and deals with a range of topics, from genetics to ecology and anthropology, including sampling, data analysis and participatory methods. The guide presents only the most basic and essential concepts. It is a compact but useful tool for the source group. (WR)

# The moral failure of the European livestock industry

Coen Reijntjes / ILEIA

Once again, Europe is engaged in the mass killing and destruction of farm animals to keep the livestock industry 'healthy'. The present Foot and Mouth Disease (FMD) epidemic follows outbreaks of swine fever and mad cow disease (BSE). It can only be controlled by massive 'preventive' slaughter, or so the public has been told.

Since 1991 European herds have not been vaccinated against FMD. This is a purely financial decision. A choice was made to orientate meat and milk production to the North American and Japanese market and these importers would only buy European products if they were clear of FMD antibodies. Antibodies conferred by vaccination could not be distinguished from antibodies present in animals suffering from FMD – hence the no vaccination policy. By accepting these export conditions, the livestock sector was able to secure a good income even though no animal in the last ten years has had any antibodies to protect it from FMD.

In recent months we have seen the fruits of this policy. More than one million animals: cattle, swine, sheep and goats, have been destroyed in the UK, one of the major advocates of the non-vaccination policy. Only a small percentage of these animals were actually suffering from FMD. The virus has now appeared in the Netherlands and has created panic. There are bans on animal movement and the transport of livestock products and large-scale slaughter of animals has started on and around the farms where the virus has been detected. Throughout the country there is confusion, protest, political wrangling and despair.

The FMD virus is extremely contagious. In general animals recover well and spontaneously from FMD, although milk and meat production may fall temporarily. FMD does not affect humans. In the present situation where export interests have priority, even the threat of FMD is a disaster for farmers, because herds are being destroyed for preventive purpose.

A vaccine exists. In the past, cattle were vaccinated every year. This provided reasonable protection. The best option was to vaccinate every six months. If an outbreak occurred, it could be controlled by quickly vaccinating herds in the vicinity of the affected farms and a few herds were destroyed.

Times have changed. The risk of FMD outbreaks have increased. Animals are kept close together and livestock and livestock products are routinely transported all over the world.

The solution to the present outbreak is simple: vaccinate all FMD-susceptible animals. Technically and financially this is a feasible solution. However, export interests prevent implementation.

Once again the break down in moral values within the European agricultural sector gets visible. Within the intensive livestock industry there is little concern for animal welfare, food safety or the environment. More and more people are worried about the safety of industrially produced food or feel ashamed of being part of the present system. Many are turning to vegetarianism or becoming advocates of organic agriculture. Increasing numbers of politicians are aware things have to change. They are coming to recognise that food safety, animal welfare and the ecological soundness of agricultural production are legitimate concerns. It is now possible to discuss less intensive, more ecologically sound and organic ways of practising agriculture. The German Government has taken a firm decision to change its policies in this direction. But what will this mean in practice? Are we really ready to change our values or will entrenched economic interests continue to prevail? Now is the time for change!

## Themes for the LEISA-India

December 2001 Vol. 3,4

### Alternatives to Biotechnology

'Terminator Technology', 'Golden Rice', 'Bt Cotton or Maize', herbicide resistant 'Roundup Ready Soya' are the products of modern biotechnology. Some claim that such developments will solve the problem of world hunger and that we need Genetically Modified (GM) crops to meet the demands of a rapidly growing world population. But do we really need these technologies? Do they deliver what they promise? Are large companies investing in these technologies interested in the specific needs and requirements of smallholders in the tropics? Will low-cost and low-risk oriented farmers benefit from these technologies? And are there other biotechnologies not based on genetic modification that provide affordable and complementary tools for improving genetic resources?

In this issue on 'Alternatives to Biotechnology', we would like to focus on the specific claims made in favour of the introduction of the Genetic Revolution in tropical farming, the risks involved and the alternatives that exist around the world. For example, do natural pest control mechanisms in ecological maize or cotton production systems provide good alternatives to high external-input based Bt-Maize or Bt-Cotton? Do people who depend on integrated rice-based systems really need Golden Rice for their daily Vitamin A supply? Are herbicide resistant crops really needed in zero tillage systems? *Deadline for contributions 15 March 2002.*

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### New ways in smallholder animal husbandry

For families involved in agriculture, farm animals are often very important, not only for food and other economic reasons, but also for deep-rooted cultural and social aspects. Should they copy the unsustainable trends from intensive animal husbandry in Europe as often propagated by development programmes? Or should development initiatives build on indigenous practices and involve the people themselves? How could indigenous and scientific knowledge support each other in making animal husbandry healthy and productive? How could cultural and social aspects be dealt with? Is it important to look at gender roles in animal husbandry, especially in terms of access to and control of animal assets and labour division? How should species diversity be maintained, inbreeding prevented and animals upgraded? How can integrated (tree-) crop-animal systems be developed or improved? Should interactions between wild life and domestic livestock be considered? What income generating activities could be developed around animal husbandry to secure the livelihoods of animal keepers? What marketing arrangements are undertaken by farmers and how can these be improved? And what about veterinary services that are so essential to animal husbandry?

*Deadline for contributions 15 May 2002.*

**You are invited to contribute to these issues with articles (about 1800 words + 2 illustrations or photographs), suggest possible authors, and send us information about interesting issues, publications, training courses, meetings and websites.**