



GATE – 3/95 – Sustainability in smallholder agriculture

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Dear readers

Women farmers in Isiolo/Kenya. This horticultural project is testing biological pest control methods.

Photo: epd

In October the Food and Agriculture Organisation of the United Nations (FAO) will turn 50. In the recent restructuring of the organisation a Department of Sustainable Development was set up. According to our readers survey, sustainable agriculture is a highly requested subject.

Enough reason to raise the issue of agriculture, which was last a focus in gate 4/90 under the heading of organic farming, in the context of sustainability. We highlight new developments in the promotion of sustainability in smallholder agriculture, since that is the message of all the Focus articles: it is not the bio-technology industry but the farmers who are the guarantors of sustainability in agriculture and therefore of the long-term food supply of the people, as Yvonne Mabilie emphasises in her location report.

Our Focus section starts with a critical analysis of the role of farmers and bio-technology when preserving bio-diversity.

The interview that follows gives an overview of organic farming in Asia and the activities of IFOAM there. A success story from Nepal shows how organic farming and the marketing of bio-products can be possible, and profitable.

In Latin America the question arises as to what extent the marketing of ecologically-produced products suffers from 'bio-colonialism'. Expensive foodstocks for the North instead of feeding the South? How organic food can be produced for local needs in the smallest of spaces is described in a report from the slums of Mexico City. In an article on bio-cotton, the prospects for North-South co-operation are revealed.

BÄrbel RÄben

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GATE 3/95: Editorial

Focus articles

Farmers are the guarantee for sustainability

Sustainable agriculture –the location issue

by Yvonne Mabile

For the growing world population to survive food production must increase enormously in the coming decades. But we cannot afford to destroy more natural resources in doing this. Uncertainty and conflict accompany the debate on how to solve the problem.

"Farmers can tell us a lot about sustainability and duration, but when it comes to tackling the issue of how we will survive the year 2050 my personal opinion is that we will have to turn to solutions in which the farmers will hardly be able to help us. For example discussions on genetic engineering and genetic research. Farmers cant help us when its a question of raising yields from 8 to 15 tons, and increasing sustainability in the genetic sense by augmenting disease and pest resistance or producing salt-tolerant rice plants – all aspects we are presently working on."

Genetic engineering

This is the opinion of Klaus Lampe, who has been director of the International Rice Research Center (IRRI) in Los Banos on the Philippines since 1988. Scientists advocating genetic engineering at the first forum of the German Agricultural Researchers Alliance (AIDA –Allianz der International ausgerichteten deutschen Agrarforschung) believe that farmers will be on the side-line in food security in the future. They believe that just one path will allow production to be intensified while simultaneously halting environmental destruction i.e. sustainable farming –namely: decoding the genetic structures.

Most development organizations on the other hand are gearing their sustainability efforts to site-appropriate land use concepts. Even when such terms as ecofarming, permaculture, agroforestry, site-appropriate farming or low-external-input-agriculture still need to be precisely defined, they all have basic common points despite the many differences in individual land use systems and the individual site conditions.

The first principle is to work in closed cycles in order to reduce outside inputs to a minimum.

Instead of buying in fertilizers, soil fertility is to be retained using animal manure or green manuring. A concept paper "Sustainable development through site-appropriate land use" of the Rural Development Department of the catholic development organization Misereor describes the situation as follows: "Subsidies and inappropriate technologies can constrain sustainable development, give a distorted picture of the actual economic situation and raise the dependency of small farming families. The goal is to reduce dependency and raise stability."

Ecofarming concepts

Another basic principle is diversification i.e. a diversity of crops and varieties which can also integrate trees and wild growing plants. Diversity reduces risks and is also a form of preventive plant protection. Traditional agro-eco-systems often imitate natural ecosystems. By designing farming systems that mimic nature, optimal use can be made of sunlight, soil nutrients and rainfall.

Production per se serves many purposes. The prime aim is not to obtain maximum production for the market but to satisfy many different needs subsistence, supply of energy and construction materials, fibre plants, medicine etc. As the Misereor concept paper puts it: "Higher production as such is not the real goal if it generates other problems and unintended side effects."

The impacts of socially inappropriate land use in Colombia.

Photo: Klaus Hornberger

Holistic thinking

Sustainable agriculture is therefore more than just an improved management concept. It has an ecological, an economic and also a social dimension which are all interlinked and have to be viewed as a whole. The reigning marketing structures and world trade conditions are also involved.

"Sustainable agriculture is designed to respond both to the needs of the population and to natural and ecological constraints in a given region," is how the working group on Food Matters from the Liaison Committee of NGOs from the European Union explains the situation in their 1991 paper "An integrated approach to Food security". They describe the goals of sustainable farming to be "an optimum yield of agricultural products on a sustained and long-term basis without destroying the environment. The priority is to identify and develop those resources that are available in the region, such as labour, water, nutrients etc., rather than rely on external inputs. This does not exclude the use of technical and synthetic methods from foreign sources, but their level must be kept to a minimum to ensure that these external inputs endanger neither the natural environment nor the physical and economic integrity of the population. Agriculture will be truly sustainable only if the social and cultural dimension of those who put it into practice is totally integrated into the process and if the decisions and implementation belong to them."

The principle of participation which is touched upon here is not yet generally practiced in cooperation for development, although it is increasingly being taken into account. In this concept the affected people themselves are to be the main actors in their own development. This means that development measures must be oriented to the needs which the people have articulated themselves. Such an approach is only possible when it is recognized that knowledge and know-how of the indigenous population and their own innovative powers have to be the basis for all action. Only then can local knowledge and the skills of experts –and also the findings of research which tackle local issues –be fruitfully combined.

Banking on the farmers

In order to create the preconditions for wide-scale sustainable agriculture and rural development, NGOs in the North and in the South are closely monitoring whether their governments are keeping to the pledge they made to implement Agenda 21 (which is not an internationally binding document) at the political level. In an international conference as follow-up to Rio in Germany, representatives of NGOs from Africa, Asia, South and North America and Eastern and Western Europe welcomed that

- the agenda expressly recognizes the need for each region of the world to be able to supply sufficient food of its own
- retaining biodiversity is a top priority
- alternative farming methods play a central role
- people at the grass roots of the development process in the Southern and also in the Northern hemispheres must become more involved.

Contrary to the scientific hypothesis put forward at the beginning of this article, the NGOs brief formula was: "No sustainable agriculture without agriculture by the farmers."

Eco-farming is also becoming a hit in Germany. A field on the Wulksfelde estate near Hamburg which has changed to organic biological cropping since 1989.

Photo: epd

Yvonne Mabile is a freelance journalist specialising in development policy and agriculture.

A Matter of Survival

How agricultural biodiversity can be maintained

by Nelson Alvarez

Biodiversity is the diversity of life: It refers to the millions of different life-forms found on earth, their genetic variation, and the complex ecological interrelations between them. As such, it is the primary life-support system of our planet, and a precondition for human survival. As evidenced at the 1992 Earth Summit in Rio, it is also a unique cultural and economic asset that governments fight over and corporations want to control.

The drama of extinction and erosion is especially strong in those areas of our planet where the resource-poor farmers and indigenous people mostly live. It was also in those parts of the world where people first started domesticating the wild plants and animals around them, thus creating an impressive genetic mosaic of local crop varieties and animal breeds that suited their needs best.

When today's agricultural modernisation schemes introduce new and uniform crop varieties into Third World farmers' fields thus displacing numerous local varieties much of this invaluable diversity is lost, forever. Scientists predict that by the year 2000, Indian farmers will be growing no more than 12 "high-yielding"

varieties of rice rather than the 30,000 distinct traditional varieties they were cultivating not long ago.

In Southeast Asia, local races of fish are dying out from pollution and over-exploitation, or are doomed to be replaced by new uniform strains of a hybrid tilapia. Huge afforestation programmes equally promote genetic erosion of innumerable traditional, often multipurpose trees, with the introduction of vast eucalyptus tracts.

Agricultural biodiversity is a matter of survival. Rarely is it recognised that local farming systems, especially in developing countries, provide the very basis of a sustainable form of agriculture, optimising the long term use of the locally available natural resources, minimising the need for external chemical inputs while at the same time providing for a reasonably stable output of food, medicines, fuel, clothing and shelter. Most local farming practices are based and dependent on an enormous degree of diversity, be it cultural, biological or economical.

See also related news under:

ITC-4: Opportunities for NGOs to get involved

Vast refrigerators for seeds

Villagers living at the foot of Mount Elgon in Western Kenya use at least 100 different species of vegetables and fruits in their diet. Some of them are actively cultivated, others collected from the wild. Mexico's Huastec Indians cultivate, in a mixture of home gardens, agricultural fields and forest plots, some 300 different plant species.

In a typical village garden in West Java it is not difficult to find 100 or more different plant species, all used for specific needs.

The recognition of the danger of the erosion of our food base has prompted numerous reactions, especially in the field of plant genetic re-sources. The first efforts, back in the 1950s, were mainly focused on collection of seed samples for ex situ (off site) storage in genebanks mostly in the North and use in breeding programmes. Genebanks are essentially vast refrigerators where seed samples are stored under controlled humidity and temperature conditions. But seeds lose viability if they are not grown out regularly. Cold storage itself can affect the genetic material in the seed and improper management, even a simple black-out, endangers much of the alleged diversity in storage.

Map of the Centres of Genetic Diversity based on those identified by V. I. Vavilov showing the principal origins and centres of diversity of twenty major crops. These account for about 90 per cent of the world's food supply (caloric intake). Source: "Growing Diversity" IT Publications, map by GRAIN.

Another approach developed mainly by big conservation groups and the UN Environment Programme is geared towards in situ (on site) conservation. The in situ approach aims to preserve whole tracts of land from development activities so that ecosystems and diversity among species can thrive and continue to evolve. Nature parks and reserves focus largely on wild plants and animals. Today nearly 6% of the world's land area is protected for conserving wild biodiversity. While protected areas are generally seen as the most effective mechanism for conserving wild biodiversity, this approach also carries its problems.

One is that many of them do not receive the active protection and management they require. Encroachment by settlers, poachers and other exploiters is widespread. Even more important is the pressure from the mining and timber industries to continue with the unsustainable exploitation of the reserves.

But most problematic with the protected area approaches is that they very often do not take into account the role of local communities that live in the area. Rather than considering them as allies in the conservation strategy, too often they are seen as enemies of nature, and consequently should be removed from the protected area.

Farmers as scientists

Yet a third approach, on-farm genetic resources management breeding, use and conservation, has been established as a viable alternative in the last few years. Although it has obviously been the backbone of agricultural development since farming began, it is increasingly recognised as a vital approach to redress the problems associated with the traditional genebank and nature park strategy. On-farm management often takes as its starting point the need to strengthen peoples control over their seeds and breeds.

Modern agriculture often means that traditional varieties disappear. In Latin America the ecologically appropriate cropping methods of the indigenous populations have retained their varieties.

Because it is intrinsically interlinked with cultural diversity, biodiversity can really only thrive and benefit small farmers where farmers can control it through community conservation and breeding activities. Farmers and local communities not only grow food they innovate, research, classify, and improve their seeds. For example, Mende farmers in Sierra Leone routinely conduct comparative field trials testing new seeds against diverse soil types. Andean potato farmers have developed frost-resistant varieties for the flat bottom lands where frosts not late blight are common. Leaf-blight tolerant varieties are sown on the hillsides where frost is less a threat.

The Bukusus people of Kenyas Bungoma region, for example, have a plant classification system possibly superior to Linnaeus. Farmers are also medicinalists: 150 drugs from North American Indians and a third as many from South America have been taken into the U.S. pharmacopoeia. The women are innovators: So the Kayapo women in the Brazil Amazon not only breed new varieties but preserve representative samples in hillside "gene banks".

Farmer-scientist partnerships are being developed in a number of countries like Ethiopia, the Philippines and Chile, to help local communities collect, maintain and improve traditional varieties for self-reliance and sustainable agriculture. Farmer-to-farmer seed exchange has been shown to be a viable and sustainable alternative to corporate-led substitution of local, hardy varieties by the so-called high-yielding modern ones, and development programs should actively support it.

Biotechnology: hinder or help?

Biotechnology the industrial harnessing of life forms and processes has been with us ever since the Abyssinians brewed beer from cereals, farmers fermented cheese from milk, and people started baking yeast-leavened breads. However, today's new biotechnologies are based on a much more deterministic manipulation of DNA and the regulatory process that guide genetic functions. Perhaps the most salient feature of the new biotechnologies is that they are predominantly developed in the North, mostly by giant producers of agrochemicals and pharmaceuticals, as well as the major food processors.

The fact that such a powerful technology is largely in the hands of the private sector in the North can lead to biases in the type of research that is being done. It is only logical that a large company would tend to aim at large world-wide markets for their products. Such products might not necessarily be appropriate for small farmers in developing countries, who tend to work in highly variable and vulnerable ecosystems and need seeds that are location specific. In that sense, biotechnology might undermine food security rather than securing it.

One example of the biases in current biotech research is the large amount of work going on to create crops that are more tolerant to herbicides. The logic of this research for the companies seems obvious: herbicide resistant crops would increase the sales of the herbicides from the same or other companies. The logic for especially the small Third World farmers and food security is less obvious: more chemicals mean higher costs, more damage to the environment and loss of biodiversity, and a higher risk to food security.

Patenting life

Of all the policy issues surrounding the development and diffusion of modern bio-technology, one question comes across as the most profound, fundamental and far-reaching: who can own it. Intellectual property rights, and especially patents, have often been presented by their proponents as an incentive to invest in risky research and a mechanism to stimulate innovation, bringing benefits to society through the availability of scientific knowledge and assurance of technical progress. The fact is that in the current free trade scenario patents are being used to monopolise the resources and knowledge of local communities and indigenous peoples all over world, including not only plant and animals, but even human genetic material.

In the North-South context, it is important to point to the fact that most of the biological and genetic diversity which provide the so-called raw material of plant breeding and biotechnology is to be found in the gene-rich developing countries. And that most of that material does not just lie around there, but has been created, modified, maintained and conserved by numerous generations of indigenous communities. Now biotechnologists come in, insert a gene here and there, and then call the whole thing theirs.

An example of this practice is a patent application for two African plants: Katemfe and the Serendipity berry. Both produce extremely sweet proteins, and are locally used as sweeteners. They have been selected and maintained for centuries by local communities in Western and Central Africa, but now the University of California together with Lucky Biotech Corporation have applied for a patent on all genetically engineered plants that contain the sweetener genes of Katemfe and Serendipity. The commercial value of these genes is likely to be very high as the industry is actively searching for powerful non-sugar sweeteners.

Again, the African communities that used the plants so long and identified its properties, are not expected to see any of these benefits.

A wide variety of vegetables make up the daily diet in many areas of Africa as these market scenes show.

Biotechnology for or with farmers?

If biotechnology needs biodiversity it does not necessarily maintain it. In trying to answer the question of how the new biotechnologies could benefit the rural poor, perhaps a useful start is to point to all the work that is not being done. Simple mass selection to improve local varieties is one example of under-supported research. Work on enhancing multiple cropping and rotation techniques, rationalisation of the use of wild plants in local diets and the upgrading of traditional crop protection practices, are just a few others. With highly promising technical solutions being heralded at every possible occasion, the focus is often blurred.

Indeed, the new biotechnologies have something to offer, but so have small farmers themselves. Research oriented towards reinforcing the solid foundations of agricultural systems which have been developed for millennia is highly sporadic and seriously underfunded. At the same time, research on the quicker short-term and high-tech panaceas which often result in the undermining of those foundations in the long-term, attract the imagination and most of the money. After all, money tends to go to places where it multiplies fast, which is often not in the fields of indigenous farmers. Only if biotechnology research takes the situation and needs of poor farmers in developing countries as a starting point, can we speak of its contribution to the building of a truly global village.

GATE – 3/95 – Sustainability in smallholder agriculture

In the meantime, events at the international, national and local level point towards new power struggles. The fact that the United Nations, the FAO, the World Bank and many other formal sector institutions are rapidly assuming the language of sustainability and timidly introducing policy changes in that direction is no reason for optimism. Nevertheless, it opens the door for further expansion of the alternatives being proposed by thousands of grassroots organisations: farmers, indigenous peoples, consumers, ecologists, women. After two decades of being concerned with the practical aspects, scientific research has come forward with huge amounts of evidence backing the viability of traditional and alternative farming systems.

Further reading:

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Nelson Alvarez works for GRAIN – Genetic Resources Action International. The international NGO, based in Spain, aims to raise public awareness about the dangers of genetic erosion for farmers and the food supply, and to stimulate the development of a more equitable and sustainable global genetic resources management system.

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Organic farming in Sri Lanka and other Asian countries

An Expanding Minority

In Japan two to three per cent of farmers produce organically. In other Asian countries fewer are involved, but the numbers are growing, for instance in Sri Lanka. Based there is Ranjith de Silva, head of the organic agriculture NGO Gami Seva Sevana (GSS) and Asian coordinator of the International Federation of Organic Agriculture Movements (IFOAM). Hugh Williamson talked to de Silva about the possibilities and problems of organic farming in small-scale agriculture and about bringing products to market.

gate: Please tell us something about your own background? Are you a farmer?

De Silva: Its a very strange background that I have. I had to give up my university career because, for family reasons, I had to go to work without going to the university. So I had no choice but to select something according to my ability. My ambition was to do engineering, but I did an aptitude test and ended up doing accounting.

I ultimately became an assistant to an internal auditor of a government corporation; that was about the maximum that I could progress. But I got into some difficulty because, well, there is corruption in every country, including Sri Lanka, and I found it difficult to work in this set up, so I had to give up.

At the same time, while doing this job, I was interested in rural agriculture, and I was also on a productivity committee set up by the government in my home town. At that time in the 1970s my country had big food supply problems. I had to visit farmers, talk with them, and I was in other related voluntary groups.

Sri Lanka: Organic gardening

Photo: Klaus Hornberger

I was the Treasurer of an organisation called Christian Workers Fellowship. They were working among industrial workers and plantation workers, and wanted to move into rural work. So in my frustration with my work I offered to do this job. My wife had a very good job at the time, and could support the family, and I asked her if she would give me permission to leave her for five years to go to the rural area to start this job. She agreed.

So I left, after 16 years working in the city. I went without anything; we found a building, but had only very little money. My organisation was worried about an accountant going to the countryside, but I had one advantage: as a boy I had done backyard gardening in the holidays so I could look after animals and grow vegetables. I was also a scout, so could cook my own meals. And the work developed into that of my NGO today.

gate: What is GSS?

De Silva: Gami Seva Sevana (GSS), meaning Umbrella For Rural Service. Its a medium-sized NGO, with the main activity, the promotion of organic agriculture. This is integrated farming, and organic farming is the

methodology. To be an organic farm it should be integrated, as it has to be holistic. We are in mid-country, in the town of Galaha in Kandy province, at an elevation of 700 metres, average temperature of 26 degrees, two raining seasons and three months of drought. The region used to support coffee, then tea, now that is eroded, so now its dairy and spices and other crops.

We run an integrated farm with cows, goats, pigs, chickens, vegetables. We cook with biogas, don't buy any fertilizer or insecticide, we just use the fertilizer that we have. We also work with botanicals, that is using plant substances to control insects. We work with a traditional plant in Sri Lanka, the Neem tree, and have been promoting this as a pesticide. We take the seeds, crush them, put it in water and the extract is sprayed on plants. This is very successful, and it's promoted across the country. We also promote biogas, building biogas tanks for people.

GSS has six extension workers, working on biogas and Sloping agricultural Land Technology that is soil conservation methods. The others promote integrated farming. We have a library, which enables us to have a question-and-answer service. We also give credit and motivate people to form credit councils.

gate: How do farmers get involved?

De Silva: We run training, a ten day course every year for forty people, plus many shorter three day and five day courses, all on integrated organic farming. We have lots of visitors, also from schools and we have a women's programme, promoting hand looms, weaving of textiles. We publish pamphlets and a magazine called "Organic Farming" in Sinhalese and Tamil, which comes out twice a year. We also have a network of 24 NGOs, interested in organic agriculture and we meet every two months to look at problems, and it is through these contacts that the training seminars developed.

Also, in a live-in programme, 12 young people a year can live with us for six months, and learn all aspects of organic agriculture, and we advise students, who use our library, which is the best on organic agriculture in Sri Lanka.

gate: How significant is organic farming in Sri Lanka?

De Silva: It is becoming more and more important every day. One reason is the cost of fertilizers, another is the danger of pesticides poisoning. With the growth of environmental groups, people are getting scared of pesticide poisoning, so are searching for alternatives.

On the other hand the commercial growers are also looking for markets with increased prices, so seeing the value of organic farming, to gain a little more money. Tea, for example: conventional tea is not profitable, but organic tea is, even though the crop yield is a little reduced. These farmers can then also develop their whole land, control erosion and develop fertility. The replenishment of the soil is slower, but surer. Vegetable cultivation is much better and the yields could be as good as chemicals but you can keep them longer and the taste is very much better.

Organic farming is still a minority activity, but for instance now we have four groups which are exporting organic tea from Sri Lanka. Organic cashew, sesame, spices and desiccated coconut are now all being exported from Sri Lanka.

Small farmers go organic

"We run an integrated farm with cows, goats, pigs, chickens, vegetables". (R. de Silva)

gate: What about the situation for small farmers?

De Silva: Im currently looking at the possibilities for small farmers who are producing food they cannot consume. It is easier for small farmers to go organic, before the plantation estates can. There are possibilities of gathering these farmers into cooperatives to sell their organic products, for the local markets and exports, for example spices.

On the local market production, we are looking at new methods of selling. Ive received support from the International Federation of Organic Agriculture Movements (IFOAM) on this. We had our first Asian IFOAM meeting in 1993, in Japan, where we were exposed to the Japanese organic movements marketing system. They have a consumer support and agriculture system, called the Tekei system: They have producer groups in villages and consumer groups in the cities. The producer groups regularly pack up what they produce, and this is collected by the consumer groups. This is an organised, long-term relationship.

Theres a very good understanding between the two: if the producers have produced cucumber in excess they inform the consumers to consume more of that kind and they also invite the consumers to come and visit their farms and work with them during their times of vacation. This is a beautiful innovation of the whole marketing structure. Here, they dont need a certification system. So Asian people are going to take this as the model for the future, for domestic marketing structures.

Certification is a big problem

gate: What is the current, broader situation with certification in Asia?

De Silva: An organic inspector from a Western country would charge as much as one years wages of an average worker for one day of inspection in Sri Lanka not including travel, hotels and so on: This is very high and many small farmers will never be able to pay this. Hence they have to be organised as a Cooperative. Therefore a co-operative system could be useful, to find the money for certification, especially as it cant be done once and for all: it has to be repeated and checked every year.

Local certification systems are also possible, but we are still at an early stage, and need a little help on this. Certification is also a business – and even on a local level, accreditation is very expensive. First we have to train people in this system; all this will take a few years.

Also, an organisation is needed to check there is uniformity in certification. For this, IFOAM set up an accreditation programme. But theres another problem. German consumers like a German group certifying products, Americans an American one, and so on, so thereby, our certificate may not be valid in certain countries.

In general, certification is needed, in the international market. Thats why IFOAM is thinking of a standard trademark, or logo. Then we could have the Sri Lankan logo and the international logo, and this would satisfy the consumers.

Japan is most advanced

gate: What are IFOAMs activities in Asia?

De Silva: IFOAM started about 20 years ago. In 1990 they discussed the idea of regionalisation, and in 1992 they elected members to become regional coordinators. I happened to be there and was elected. In 1993 we had the first Asian meeting in Japan hosted by the Japanese Organic Agricultural Association (JOAA), with people from India, Pakistan, Bangladesh, Nepal, Japan, Philippines, China, Cambodia, Korea, and Sri Lanka. We discussed the possibility of cooperation, of helping each other in organic farming.

gate: How does organic farming vary between these countries?

De Silva: India produces organic cotton and organic tea, the Philippines produces organic sugar and bananas. Japan produces almost every organic product, and has its own certification programmes. In the developing countries, the certification is done by European certification agencies, and now also more recently by those in Australia.

There is a growing significance of organic farming in Asia: In Japan, people want safe food, in China there is a green food movement, and in India, Indonesia and Malaysia there is growing interest in organic food. But it is still a minority. In Japan, where it is most advanced, 2–3% of farmers produce organically.

IFOAM provides a unique opportunity, especially at its scientific conferences, to share experiences and learn techniques being developed in other countries. The regional developments are also very important, although it may be necessary in the future to sub-divide the region climatically, as at present Asia is too big.

gate: Are there any common problems of IFOAM members in Asia?

De Silva: One is certification, but regarding growing, there are few problems, because we have traditionally been growing organically. Organic farming takes the strengths from traditional farming and from the developed science from the world, puts these together for a system which relieves the earth for better production. We have forest products, for instance, which are 100% organic, for instance from trees, fruits and honey.

Organic food for the poor?

Organically grown tea in Sri Lanka.

We don't want to price high. The question is: should organic farming be beyond the means of the poor? In Sri Lanka, the type of marketing we are promoting, we are keeping the prices at the normal prices, but the marketing should be differentiated, so the middleman's price can go to the sellers. In most perishable commodities, the middleman's mark-up is always very high. So we want the consumer to market the producers goods, and absorb the transport by the consumer. But this depends on the commitment of the consumer. Even here, the consumer does not have to pay more, if they get organised, with joint transport.

gate: But at present organic products are not for the poorest in Asia?

De Silva: That is true, but if we can develop this marketing system, the possibilities are there. I have a small experiment in Sri Lanka, where I'm selling at the normal prices, not the high prices.

In reality, there are always two groups involved. One group will look at marketing, that is traders trying to make a surplus, while the other groups, who look at social commitment and the environment, safe food, see it in a different way. So we need such a committed group of people to continue our work.

With my experiment, I have a group of 30 people who are producing vegetables. Our extension team is visiting these people every week. We also provide the seed material on credit terms, and collect the vegetables, also on credit terms. We then have a vehicle, and therefore function as a middleman. They put mixes of the products into packages, and tell consumers they have to buy the whole package, they can't have a choice.

For this experiment we have selected a group of students from the agriculture faculty of the University of Sri Lanka, which is near our place. The aim is to convert these students to organic farming, they have visited our

farm and study our methods. City groups are also demanding these packages.

We have agreed with the producers that we charge a certain amount, for transport, depending not on the distance but on the level of production. Otherwise, the prices are normal market prices. The project has been going one year, but not fully, due to problems with weather and drought, but, in fits and starts, we are going on. Sales have been very good, and we cant meet the demand, so it needs to expand!

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Sri Lanka

Appropriate agricultural alternatives in Nepal; Possible and profitable

by Judith Chase

Organic artichokes for tourist restaurants in Nepal, produced by local smallholders in the Kathmandu Valley – this was how the Appropriate Agricultural Alternatives farm which Judith Chase founded in 1987 began. The project, supported by the GTZ and other development organisations from the USA, Denmark and the Netherlands, demonstrates how organic farming is not just possible, but, when marketing is well organised, can also be a profitable venture for small farmers.

The basic ideas and principles of the biointensive approach are consistent with traditional Nepali agricultural systems. Before the introduction of synthetic chemicals in the 1950s, Nepals agricultural systems were completely organic, although the concept was unknown. Even now, the distinction between "chemical" and "organic" agriculture and produce has not been fully recognized.

From the beginning of our project, our aspiration was to inform the Nepali farmers about the hazards of synthetic chemicals and to encourage them to return to their former practices. Our objectives were three: To assist the farmers to return to their organic traditional farming ways, to return the farmers earth to its original organic state and to provide fresh, high quality, organic produce to the consumer. The outcome of these objectives would be automatic reduction of soil, air and water pollution.

We called our farm Appropriate Agricultural Alternatives (AAA) not identifying with any particular agricultural view, but rather being open to using approaches, principles and practices which seem appropriate for the situation.

AAA Farm is located in the Kathmandu Valley –in the countryside south of the traditional town of Thimi in the village of Gamcha. The farm includes two acres (16 ropanis) of land with a number of traditional Chettri–style farmhouses.

"Lotus Land" Cooperative

On Earth Day, 1990, we inaugurated a small training group of local farmers and hired a part-time supervisor. The trainees came on Saturdays for training and practice, and three days a week to study either Nepali or English. Each participant was given a small plot of land within AAA farm. We introduced the process called deep digging or double digging which is a method of preparing aerated and fertile soil to a deep level. This method is the basis of the biointensive method of gardening and farming. The plots were planted with a variety of seasonal vegetables. The trainees were excited about learning new approaches and processes as well as growing new varieties of vegetables which they had never seen before.

"The basic ideas and principles of the bio-intensive approach are consistent with traditional Nepali agriculture systems".

The produce from these plots was eventually marketed along with AAAs. They discovered that many of the vegetables such as artichokes, leeks and arugula were in high demand by foreigners. Foreigners also appreciated and were willing to pay more for organic produce.

After six months of working in these original small plots and marketing to several small markets in town, the demand for quality organic produce was clear. If we wanted to demonstrate to the larger community the efficacy of this system, we needed more land for our training group. Because we wanted to be able to supervise their activities and to develop an area as a demonstration place, we chose to lease 2 acres of land adjacent to our own AAA farm. The original training group was invited to participate full-time and was registered as an NGO known as Lotus Land Organic Farm Cooperative. At "Lotus Land", the cooperative members prepared beds according to biointensive processes, introducing bonemeal for phosphorus, calcium and its acid-neutralizing effects, mustard seed cake for nitrogen and its pesticidal properties, compost for opening and enlivening the soil with microbial life and, in the initial stages, human hair collected from Kathmandu barber shops. Hair is 14% nitrogen, much higher than animal manures.

Ayurvedic pest management

Kaminee Vaidya, an ayurvedic specialist by family lineage and an entomologist by profession, studied our insect problems and developed formulations based on both ayurvedic principles and entomological knowledge.

Kaminee discovered that in areas in which blue, purple and red-leafed vegetables had been planted there were few if any aphids and cabbage loopers. This observation began a preventive approach to pest management based on the idea that diversely planted or naturally occurring systems are more balanced and healthy. Eventually, research led to the development of pest prevention planting patterns (pppp), systems of planting vegetables and herbs in particular combinations in order to obviate insect infestations. There are four points to this system. First of all, plants with red, purple or blue leaves repel aphids, so that if they are interplanted with green-leaved vegetables, the populations of aphids will be reduced. Entomologists have noted that purple leaves contain antibiotic substances, so that insects know instinctively that these leaves are bitter tasting. In fact, if insects do nibble on purple leaves, their populations will gradually decrease. Secondly, plants with strong odors such as onions, garlic, coriander, chives, basil, mints or shallots repel both aphids and butterflies & moths. Moreover, some insects prefer smooth leaves and dislike rough, while others act conversely, and some insects prefer plants with whole leaves such as cabbage and lettuce while others prefer serrated leaves such as those of carrot and coriander. Finally, we interplant vegetables and herbs of various fruiting heights so that the soil and air spaces are evenly filled with leaves, fruits and roots. This allows even circulation of air and water and provides a living mulch, as the plants at maturity completely cover the soil.

Kaminee's research was conducted at both AAA and Lotus Land farms. Her suggestions were incorporated as standard planting procedure at both farms with impressive results for certain insect problems. Both aphids and caterpillars, common problems for most vegetable farmers, have been substantially reduced using these

planting patterns. Red ants and cutworms have been reduced by the regular use of mustard cake as a fertilizer. Red ants, if they do appear, can be easily treated with a mixture of mustard cake, woodashes and chile pepper.

The original planting patterns were quite complex, requiring interplanting of four or more varieties of vegetables or herbs within one plot. Observing these plantings, some farmers felt that they would require too much labor and care compared to simpler planting patterns. In an effort to simplify the planting, weeding, fertilizing, hilling up and harvesting of vegetables, we have attempted to separate the components of the planting patterns, and planted our main crop vegetables such as eggplant and bell pepper inside a protective border of colorful and strong odored plants such as chives, mint and basil.

Saturday farmers

Most of the vegetable growers in the project are women.

From the very beginning of the Lotus Land project, we were interested in reaching out to additional local farmers besides the original 13 members of Lotus Land. We posted invitations in local tea houses and offices for Saturday morning discussion sessions. We encouraged farmers to talk about their experiences over the years.

Some of the Saturday farmers began to experiment on their own lands with the process of deep digging, aided and advised by AAA staff. After the plots were dug and prepared, AAA furnished seedlings and seeds. As these vegetables began to produce, we offered to market whatever the farmers could produce. This group of farmers was eventually structured as Associate Farmers (AF), people who farm on their private lands with some inputs and marketing services provided by AAA. Our extension activities has grown over the last four years to include vegetable production, rice, wheat and potato production, honey-bee keeping and fruit and nut tree raising. During this four year period, Associate Farmer membership has grown to 200 members. Few of these farmers are growing vegetables for our markets. Most of these vegetable growers are women who are gardening on approximately 1/32 of an acre. This means that very small growers have the opportunity to market their produce at increased prices. It gives these women, many of whom are uneducated and unable to earn an income in any other way, an opportunity to gain extra income while remaining in their homes.

Besides vegetable and grain production, AAA has completed two one-year bee-keeping training programs for 55 people and has introduced new varieties of peach, pear, plum and almond trees. Both the bee-keeping and fruit tree programs have been aimed at those living on drier slopes, where production of vegetables is impossible during the dry winter months. Besides providing fresh fruit and nuts for domestic consumption, production of almonds, pecans, walnuts and macadamia nuts will be a valuable income source. Nearly all of these nuts are imported from other countries at present.

The Lotus Land Cooperative had 16 participants in 1994 who are producing vegetables and grains on two acres of land. This group has demonstrated that organic production is possible and profitable. They have also shown that interplanting according to Kaminee Vaidyas recommendation is beneficial.

Selling the products on local markets

Over the last four years our markets have expanded gradually, leading to the registration of Lotus Organic Private Limited, a group of farmers who coordinate the production from the cooperative and Associate Farmers groups with the local markets. We now offer four farmers markets per week as well as supplying vegetables to several restaurants and hotels. From the beginning our prices have been maintained at approximately twice the local retail market price for the same item. This difference in price encourages farmers to return to organic practices, knowing that the increased cost of organic inputs (bonemeal, mustard seed cake and compost) will be covered by the increased income. Eventually, as the soil becomes more alive

and rich, loose and open, the need for inputs decreases. We hope that eventually the prices of some vegetables, especially those preferred by Nepalis, will decrease to just 1020 percent above non-organic produce. However, costs of marketing such a large variety of vegetables, grains, and herbs from such a large number of producers does require more labor than simpler production and marketing systems, so prices will probably always remain higher than chemical produce.

AAA farm as a center of training and research

The base farm, Appropriate Agricultural Alternatives Farm, has developed as a center for research, demonstration, training, production/marketing, and supervision of extension and cooperative farmers. The main areas of research are:

1. soil fertility improvement
2. prevention and/or treatment of pests and disease using Ayurvedic means
3. trials with vegetable, fruit and nut varieties
4. systems of fodder trees and grasses, and
5. composting approaches.

"From the beginning our prices have been maintained at approximately twice the local retail market price for the same item. This difference in price encourages farmers to return to organic practices".

In addition to these, we are continually working with Caminee Vaidya to develop new approaches to pest resistant plantings. Recently, we have adjusted these planting systems to make them more attractive to larger scale farmers.

Demonstration of the successful production of vegetables, fruits and nuts using organic means has been an on-going function. Visitors from agency projects, governmental offices, foreign countries and Nepali farmers arrive almost daily to witness the evidence. During the past year, training at AAA has increased until 1994 substantially, so that training is now a major component of our programs. By 1994 some 500 farmers have visited our site for training programs of various kinds.

Instead of using the AAA Farm site exclusively for training, we are now expanding our training approach to offer agencies involved in agricultural development a linking service, in which we conduct training courses on their project sites, where we can observe directly the problems and potentials of the particular area. AAA will also analyse the site for potential market crops, guaranteeing a market if the agency guarantees organic production. Throughout the training we emphasize farmer participation and direct experiential learning. We also encourage continual follow-up programs, so that this process of linking can be maintained.

Although AAA has developed the Lotus Land Cooperative and the Associate Farmers (AF) as the main producers, AAA does produce enough to supplement supplies when necessary. AAA also takes responsibility, via Lotus Organic Private Limited, for marketing the produce of both the cooperative and the Associate Farmers to various restaurants, hotels and farmers markets. AAA management also supervises the cooperative and AF extension activities.

GATE – 3/95 – Sustainability in smallholder agriculture

The efforts of both farmers and governmental agencies will need to shift to sustainable agricultural systems if Nepal is to continue as a healthy and productive agricultural country. In order to accomplish this, we need to encourage the Nepali government to use its own well-developed agricultural system to communicate and teach sustainable practices.

Judith Chase from the USA, came to Nepal in 1976. She was manager of the Appropriate Agricultural Alternatives farm, which she set up in 1987.

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Organic Cotton

Successful Indian–Swiss cooperation

by Yvonne Mabile

30% of the weight of a cotton T-shirt is made up of chemicals. The high input of chemicals to cultivate and process this natural fibre pollutes both humans and the natural environment. The alternative is organic cotton. The author reports on a successful cooperation venture between an Indian spinning mill and a Swiss cotton trading company, who began an organic cotton project in Central India in 1992.

Cotton is the most important textile fibre on the world market. Numerous hybrids and varieties of this fibrous plant are grown in over 70 countries of the globe, chiefly in the tropics and subtropics. Half of global cotton production in 1993/1994 was produced by five countries China, USA, India, Pakistan and Uzbekistan.

Progresses in plant breeding and intensive cropping practices have brought enormous increases in cotton yields during the second half of this century. In the mid 1930s a cotton crop averaged 200 kg of crude cotton per hectare, where as nowadays, in the mid 1990s, 600 kg/ha can be harvested.

But high productivity has its price, just as in all other branches of agriculture. About 50% of the c. 300 million kilograms of pesticide used in developing countries each year is applied to cotton plants – whether on large mechanized farms or on the fields of small farmers men and women –who still produce the greatest part of the crop. The consequences for the environment and the health of the cultivators are disastrous. The application of organochlorides such as DDT is still permitted in some countries. According to the WHO, an average of 20000 people die from pesticide poisoning each year.

Extension officers from Maikaal Ltd. inspect the fields once a week. The adviser kneeling on the ground is Tadeu Caldas, an agronomist from Brazil.

Photo: Remei

The Indian–Swiss experiment

In the year 1992 an organic cotton project was launched in the Kasravad District in the Federal State of Madhya Pradesh in the center of the Indian subcontinent. Right in the middle of this main cotton cropping region, the Indian spinning mill, Maikaal Ltd. and the Swiss yarn trading company Remei AG commenced a special cooperation venture. Initially, Remei AG only planned to place the yarn produced by this new spinning mill on the European market. The Swiss know the market for cotton and yarn extremely well. They have been supplying European weaving mills, cotton twisters and manufacturers of industrial clothing and socks or more than ten years with (conventionally grown) cotton yarns from Africa, Asia, Rumania and Estonia. During the negotiations between the Swiss and Indian companies the subject of organic cotton was brought up.

"Farmers growing cotton along conventional traditional cropping methods spray the shrubs up to 30 times" said Tadeu Caldas, who is working as advisor to the organic cotton project in central India. The agronomist from Brazil continued: "About half of the production costs for cotton growing worldwide are spent on pesticides not to mention applications made during downstream processing."

All the more reason for the Indian–Swiss cooperation partners to risk the experiment with organic cotton.

During the first year only one farmer grew organic cotton on a six–hectare area. 1993/1994 saw 223 farmers applying these methods on 187 hectares. And in 1994/1995 there were some 600 farmers on 496 hectares. They harvested 220 tons of ginned cotton compared with 68 tons in the previous year. The cotton fibre is plucked by hand.

When running to full capacity, the spinning mill aims at an output of 15 tons of ginned cotton per day. Some 2000 farmers could be integrated into the project in order to achieve this production goal, each one cropping less than four hectares.

Break the vicious pesticide circle

In the meantime, Maikaal and Remei have expanded their cooperation to cover two more projects in other regions of India. "A large number of farmers are seeking an alternative to pesticides" says Tadeu Caldas.

A cotton bloom

Cotton cropping is more problematic than most other crops because the plants relatively long growth and maturity periods make them very attractive for pests. They have fleshy leaves and seedpods – or cotton bolls. The close foliage and the cotton bolls protect insects from the sun, the rain and from their natural predators. Several generations of insects can grow during the long ripening period – which lasts 180 to 210 days in the Kasravad District, for example. The farmers spray on more and more pesticides, to which the insects quickly develop resistance. And the vicious pesticide circle begins once more.

The Maikaal Remei project intends to grow cotton along the principles of biointensive agriculture. As Caldas puts it: "We want to develop a system which is appropriate for the region and is both ecologically and socially

sound."

Most farmers in the region are small cotton growers operating a mixed cropping system on 2 hectares of land. In addition to cotton they grow staple foods such as millet, pigeon peas, wheat, maize and various pulses. Oxen are chiefly used to till the soil, which is of average fertility. 20% of the arable land can be irrigated from natural sources or water from the Nardama River: When the monsoon rains the Kharif set in in June/July, farmers commence sowing.

The cotton plants whose fruit not only provides fibre but also seed grains rich in oil and protein needs a loose soil, rich in humus and during the first three growth months considerable natural or artificial irrigation.

Contracts with farmers

When a farmer decides to cooperate with Maikaal/Remei, s/he first enters in to a sort of contract. The producer signs a list of obligations s/he undertakes to carry out for example, to follow a detailed development plan for his/her farm, to acknowledge the principles of biointensive organic farming and to utilize the proposed technologies. In response, they receive advantages such as access to loans, training, extension services or bonuses. Cotton growers who do not keep to the agreement can be excluded from the system.

Extension officers from Maikaal Ltd inspect the fields once a week. The extension officers receive special training once every three months from Tadeu Caldas. When field inspections revealed irregularities last year for example the use of prohibited fertilizers it was decided to intensify extension services to the farmers in future.

Growing food crops and cotton together is a specific challenge for the producers in the Maikaal project. "We want to design a production system in which cotton the cash crop does not push out all food crops.

They are not only to be planted in rotation to cotton, but also interplanted alongside the cotton plants" stresses advisor Caldas, who has been concerned with tropical and subtropical agri–culture since the end of the 1970s.

The Maikaal project has so far tested the following mixed cropping and intercropping combinations: cotton and groundnuts in the first year, in the second year first maize, mung, cowpeas, millet, pigeon peas, sesame, peanuts and finally wheat and green manuring, in the third year, cotton and soya.

"Profits have generally receded during the transition period in the first years", says Caldas, "because the entire system is being reformed". However, in two to three years time, it will have become fully adapted to the prevailing environment.

Eco–cotton: A cotton picker proudly displaying her crop.

Plant protection

Biodiversity is not only significant to ensure food security. In eco–farming, which really prohibits the use of conventional agrochemicals, interplanting also reduces the need for preventive plant protection.

In conventional cotton growing, years of spraying with synthetic pyrethroids have made the white fly very resistant. Other pests are the pink and the American owlet moth, the leaf hopper and aphids. "Aphids do not

exist in eco-farming" reports Caldas. Far less larvae of leaf hopper and owlet moths are found compared to conventional cropping. The eco-farmers use light traps to monitor the larvae of the owlet moth. They use trichogramma and promote natural predators such as ladybirds, spiders and chrysopa. Numerous botanical methods are part of pest control. Margosa seed extract and margosa oil, pepper and garlic are already used. The impact of other plant extracts is being tested.

Local farmers and scientists are taking part in these experiments. Government extension officers and representatives of rural organizations are also involved. This participatory approach will ensure that the research really tackles the urgent problems facing producers in the region in order to find locally appropriate solutions. As Caldas reports, the farmers are already aware of some of the measures involved in this bio-intensive farming system; they are, or were already familiar with preventive measures or thinking in natural cycles, for example raising the plants resistance by means of improving soil fertility. Now additional measures aim to stimulate or enliven the biological activity in the soil, for example spreading compost, biogas slurry or planting nitrogen fixing trees, which simultaneously protect the fragile cotton plants from the wind and are an enrichment for the landscape.

New marketing structures

Composting.

The closely coordinated cropping practices in the organic, dynamic farming system are only one leg on which the Maikaal/Remei project rests. Even optimally produced cotton would not help small producers in developing countries to survive unless new processing and marketing structures are set up to round off the system.

First of all, the credit-awarding system had to be improved. In the past, Indian banks were only willing to award loans if half of the money was immediately invested in agrochemicals. Only when Remei AG assured the banks they would buy the crop come what may, were the banks willing to drop this condition. Remei and Maikaal then continued by building a completely new bridge between producers and consumers. A chain was established which interlinks all people involved from the cotton trader, via the spinning mill, the weaving mill and the processing industries, right through to the final user in Europe all people who are normally anonymous and in competition with each other. These newly created structures are designed for a long-term partnership an absolute contrast to previous practice.

Remei AGs self-image is that it is not a trading company earning its money on speculations, but rather a "service company". Remei trades with fixed margins.

Customers accept "social" prices

Cotton markets are becoming increasingly intricate: the ups and downs in cotton prices can sometimes compare with those on the foreign exchange markets. Whereas prices fluctuated over a 56 month period some time ago, nowadays enormous leaps of up to 100% can be generated within just a few weeks. The weakest link in the chain the producer is always hardest hit. But if producers, spinning mills and further processing industries disclose their trading margins, there is no need for security based on speculative buying. This could halt the pressure on the producers.

Remei's yarns are about 35% more expensive than conventionally produced cotton yarns. This is cheaper than other organically grown fibre. The final product for example underwear marketed by the Swiss "coop" only has a 10 to 15% mark up on conventional garments, because the raw material only makes up 30% of the overall production costs.

Remei believes that goods produced on an ecologically and socially sound basis should not fetch vertiginously high prices. To ensure support to the producers in times of excessive price fluctuations, Remei AG invoices three items to its customers:

1. the price of the yarn,
2. a development levy to finance the advisor and
3. a contribution towards a social fund.

A foundation is presently being set up to manage this fund, which will be used to assist farmers in emergency situations, but also for training and extension services.

A farmer in front of his compost heap. Most farmers in the region are small cotton growers operating a mixed cropping system.

Photo: Remei

Remei's customers accept this type of invoicing. In their decision to buy organic cotton they and other consumers not only support non-pollutant production but also the health of the farmers and a pesticide-free landscape in the cotton growing regions.

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Biocolonialism in Latin America?

Small farmers and trading with organic produce

by Andr  s T. Wehrle

NGOs aiming to advance rural development, and health conscious producers have all promoted organic farming in Latin America. Although these efforts focused on small farms, the large-scale agro-industries are now the chief beneficiaries of the dissemination and internationalization of trade with organic products.

Latin Americas agriculture is characterized by an expansion of large farms, monocropping, dependence on foreign raw materials and financial assistance, and the general approach of aiming to maximise profits. Traditional small farming communities chiefly geared to food security and conservation of natural raw materials are facing a crisis situation.

Nowadays the work of hundreds of NGOs and producer organizations is geared to identifying alternatives for small farms. They are trying to develop a new form of farming which generates healthy products and simultaneously conserves natural raw materials. Organic farming plays a predominant role in this context.

If we disregard the farming societies of past centuries, it can be said that organic farming, as it is known today, began in the industrialized countries as a movement of farmers and consumers, seeking alternatives to chemical-intensive agriculture and traditional food marketing methods. Their goal was to safeguard the economic livelihood of small regional producers.

Certification and international marketing

Parallel to the trend of replacing neighbourhood markets in direct contact with the producers by remote trading markets, certification programs began to be set up, initially in the USA and in Europe. Other countries followed this example.

Producer standards and licencing programs for eco-agriculture have paved the way for regional, national and international trade with organic products. A new generation of companies and trading groups is developing which facilitates (and profits from) the creation of new markets for organic agriculture. The internationally operating certification organizations are becoming more and more attached to trading interests, which they want to uphold in the markets of the North and South.

In Germany, IFOAM, the International Association of Organic Farming Movement was set up, which established standards for organic farming and food processing and minimum norms for control and certification to serve as orientation for the organizations in the association. Certification regulations for organic products are then standardized between the different national associations, and organic products are then marketed on this basis both on the domestic and international markets.

Disasterous impacts

Price fixing for ecoproducts and their mass-production and trading have had disastrous impacts on small producers.

Photo: Klaus Hornberger

In June 1991, the EU issued Directive 2092 regulating trade with organic products in the European Union, and permitting the marketing of products labeled "organic", "biological" and "ecological" if they are subjected to a recognized certification system by the agricultural ministers of the relevant country.

While the regulations were to protect organic agriculture and keep off pseudo-organic produce, the law also brought about intensified bureaucratization of the certification process which in turn enhanced costs, which

are partly subsidized by the governments. Control and certification are carried out by private-sector institutes recognized by the government.

European legislation requires that the EU-producer countries have comparable legislation to enable eco-products to be imported from EU-countries. For products from non-EU-countries, special certification procedures allow for recognition according to the EU directives. A similar law is presently being worked out in USA and Canada.

Later increased interventions by the governments and government authorities in the certification procedures and in the form of intensified regulation for industry made it more difficult to interlink trading interests and certification programs.

Both traders and governments became increasingly interested in a legal regulation of the marketing of organic products. Price fixing for eco-products and their mass-production and trading have had disastrous impacts on small producers.

International trade in organic products is now in the hand of a few companies and has become a constraint to the development of small farmer trading with organic products in producer countries.

Biocolonialism

The debate surrounding the intensified international trading with organic products has to date exclusively addressed certification of the cultivation standards, and not addressed political regulations protecting small-scale producers or agricultural regions affected by price fluctuations and quantity regulations. This has caused uncontrolled developments in the organic agriculture industry.

In Latin America and the Caribbean new forms of biocolonialism are becoming apparent in the form of international organic agriculture which produces appropriately controlled organic products from the countries of the South for the markets of the North.

Yet, Latin America has numerous networks of organic producers who assure food security for people in the region and aim to protect the economic interests of small-scale farmers. They advocate the NGO agreements on sustainable agriculture and food security, drawn up in Rio 1992, at the International Forum of NGOs and Social Movements.

Governments in Latin America have begun to draw up regulations and legislation for the certification of organic farming produce, the aim being to promote exports of these products but also to better exploit the potential for small farmers to produce healthy foodstuffs. Raising peoples living conditions is to facilitate the preventive management of natural resources.

Certification too expensive

The obligatory control and certification for all products as carried out by private companies is very expensive and can only be paid by export-oriented large-scale producers. Small and medium-sized farms growing organic products for the domestic market are forced into illegality or have to sell their produce on the traditional markets because they cannot raise the money for the legal certification procedure.

In Argentina, for example an equivalent law has led to the situation that the vast majority of organic products for the domestic market were sold without an official licence, meaning illegally, since the small farmers were not able to afford the costs of certification. Due to pressure from organic farmers, who were members of the organisation APROBA (Asociaci3n de Agricultores Org4nicos de Buenos Aires), the government had to

allow the organisation to certify the products of its members itself.

Producer and consumer

The consumer only demands certification when she/he does not personally know the producer selling the goods. The certification company only confirms that no pesticides, hazardous substances or artificial fertilizers were used when growing the products; only more serious companies also control whether production was based on environmentally compatible methods.

As we know, consumers do not generally give much thought to the origin of the goods they buy, the producer, the type of production process and the producers interests.

But it is exactly this lack of information and commitment which must be changed. Marketing must aim to build up confidence, promote recognition and respect between producers and consumers. Eco-farming must ensure that the consumer becomes aware of his/her social responsibility, to become informed of the needs, demands and problems facing small and medium-sized agricultural producers and not just aim to consume healthy products, but also goods which are produced in a context of ecologically compatible, economically viable and socially just production principles. The winning back of confidence and trust is a major factor in alternative marketing strategies. The entire certification process can become a constraint which hinders consumers from getting to know the producer better and to trust him. Certification must therefore be based on mutual confidence between the parties involved the farmer, the traders and the consumers.

Good examples of this are, for example, producer-consumer cooperatives of farmers and consumers in Brazil, and "consumer-supported agriculture" which has been set up in California.

The trustworthiness of certificates is not, however, just a question of confidence; controls are also carried out. Farmers production records are regularly reviewed. The difference compared with customary certification practice is that the group itself controls its members, i.e. the group as a whole gives the procedure its honesty.

In Chile, the "Asociación de Agricultores Orgánicos Tierra Viva" has worked out a certification procedure which has an approval committee to ensure that members adhere to the Tierra Viva farming standards. The goal is to guarantee an organic product quality to domestic consumers, without boosting production costs because of a complex certification system.

Also in Peru, organic farmers are beginning to organize themselves for their own benefit. In the Marañón-region in the east, some 400 farmers are working approximately 2000 hectares of arable land as a part of a transformation scheme to change from traditional agriculture to eco-farming. Organic coffee farmers also work in this program. But Peru does not just operate organic farming; a certification organ, "INKA CERT" has been set up which gives farmers access to the approval system, and provides the necessary security when marketing their products.

Conclusions

Latin America has good preconditions to develop organic agriculture as a way of ensuring the livelihood for farming populations. However, there are not sufficient plans for the targeted promotion of this approach. The task on hand is to introduce forms of production which include an appropriate marketing system to help farmers improve their living conditions.

But both in the USA and in Europe, an "industry" has developed simultaneously to efforts in eco-farming. The eco-movement is being subjected to new forces, and informal producer and consumer networks working outside the dominant production-system are faced with deep-reaching changes because of the arrival of

certification programs as a government instrument to regulate organic farming, large-scale eco-factory-farms and the international trade in organic products.

Two trends result from this new situation. On the one hand, the production and international trade with organic produce is increasing, while on the other, the tensions between the different sectors and geographic regions of the eco-movement are also increasing.

These trends give rise to several questions:

- What should be the goal of efforts to promote organic agriculture at national and international levels?
- What should be the aim of support to the network of producers, traders and government institutions for organic produce?
- What agricultural policy (including production and marketing of organic products) is most suitable for sustainable agriculture?

Even if organic farming has become increasingly legitimized and received intensive support over the last decade, we must nevertheless recognize that to date it only constitutes a very minor proportion of the world economy.

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Organic food production in slums of Mexico City; Container Farming

by Rodrigo A. Medellín Erdmann

By the middle of the 1990s, forty million Mexicans –nearly half the total population –fell below the poverty line. And of these at least 15 million live in extreme poverty – above all in urban marginal areas like the slums of Mexico City. Some seven years ago ANADEGES a group of some 20 autonomous NGOs launched a project to help the people there to develop their own autonomous capacity to produce food organically in small backyards or patios, balconies, roof tops – as a way to partially counteract the poverty being imposed upon them.

The technology had to address four constraints: little or no land, little or no investment in infrastructure, no purchase of chemical inputs and be light weight for roof top cultivation.

Three years were spent in a quasi–experimental stage. It is important to point out that these experiments were actually a trial and error process by an amateur with no agronomic training. An expert would have probably taken a much shorter time. On the other hand, an expert agronomist would probably not have dared to experiment with such lowly technology. During the last four years, the project has been introduced to several hundred families in six different slum areas of the city.

The starting point was a cultivation technology developed by Dr. Barbara Daniels in California, USA, in a nutshell: vegetables are grown in drainless containers ideally with 18 to 20 liters capacity – stuffed with deciduous tree leaves or grass clippings up to 4/5ths of their capacity, topped by a three to five centimeter layer of good soil, where seeds are planted, or seedlings are transplanted. On the wall of the container, five to ten centimeters from the bottom, a hole is bored for drainage the container thus maintains a water reservoir at the bottom. Finally, a stick is inserted right down to the bottom, that is used to measure the containers humidity as you would the oil in a car. A container thus prepared, weighs far less than one filled with regular soil.

The best organic fertilizer: urine

The key to this technology is fertilization. While chemical fertilizers can be used, Dr.Daniels suggests a much better alternative: an organic, domestically produced high power fertilizer. Regarding fertilizer, considering the expense of commercially prepared fertilizers, the amount needed for a full–size deck garden and the fact that many of them dont work well, I have found that urine is the best fertilizer for this system. The decaying leaf medium breaks it down almost instantly so that there is never any odor, and germ survival in material such as this has been shown to be practically nil. We call this liquid organic fertilizer (LOF).

The LOF, a key element in this technology, is abundant, with no cost, and easy to manufacture.

For several years the aim was to obtain empirical results in terms of low cost organic production of vegetables. During this time no thought was given to scientific experimentation. Consequently the results were gradually observed and understood in a merely empirical fashion, with little quantified data. We arrived at five main findings:

1. Plants grew more rapidly, bigger and healthier than those grown with conventional agricultural techniques. Less water was needed.
2. In the case of plants that produce edible leaves lettuce, spinach, Swiss chard, chives, parsley, quintoniles (*Amaranthus hybridus*), quelites (*Chenoponium album*), verdolagas (*Portulaca oleracea*) and all types of herbs – the produce was outstanding. Leaves were big and bright dark green in color. Particularly remarkable was the nopal (*Opuntia* sp.), a cactus with big, green, prickly, pallet–like edible leaves actually transformed stems, tender and fleshy (pencas in Spanish) very much appreciated in Mexico. It has excellent nutritious value it has

been called the Aztec beefsteak and serves as a natural medicine for example, for diabetes.

3. Some fruit bearing plants, specially hot peppers essential in the Mexican diet grew well and produced abundantly; but were not as hot as those conventionally grown.

4. Other fruit-bearing plants did beautifully in their early stages, but rather poorly in terms of fruits. Such was the case of tomatoes, green tomatoes (*Physalis pubescens*), squash, beans, cauliflower, cucumber.

5. Some experimentation was made with root plants, but not much, since the containers being used had a relatively small diameter, and could accommodate too few plants. There were good results with radishes. However, people would certainly be interested in onion and garlic. Carrots are usually so inexpensive in the market, it is not cost effective to cultivate them.

Other intriguing features: all plants did particularly well in their early stages; they proved remarkably resistant to insects, pests and diseases.

A warm bed for the plants

The next stage was to understand these first results, and to look for ways of improving them. In short:

- LOF was an excellent source of nitrogen (N), readily absorbable by the plant. This was why the leaves did so well.

- In this technology there was a deficiency of phosphorus (P) and potassium (K); no idea about minor nutrients;

- The initial process inside the container was a very intensive anaerobic composting, which raises temperatures this acted as a warm bed that helped plants in their early growing stages.

More puzzling was the resistance of plants to pests and diseases. In one instance, a set of tomato plants was growing near a tree heavily infested with the white fly. Many of these insects would fly around the plants ordinarily so prone to being attacked by them but not one landed on the leaves. They simply flew back to the tree. Eventually, an article in a German scientific journal gave us the clue. The composting process taking place inside the container produced substances that helped the plants become not only stronger, but also resistant to pests. An added bonus.

At the end of a year, the composted leaves had turned into a beautiful, rich soil. Each container produced enough soil to supply the top five centimeter layer in ten new containers, or for any other use.

If the technology was to be really useful to people, the missing elements had to be found. What was needed was a cheap, abundant, readily available, organic source of P and K, like we already had of N. Furthermore, these two major nutrients had to be immediately absorbable by plants, since their life cycle was so short: three or four months. It was not the case of some organic matter that could be mixed with soil to be decomposed over several months or years.

As is usually the case, the solution was found by chance, to a certain extent. For other reasons Anadeges began to experiment with worm raising, the type that process organic waste red worms (*Eisenia foetida*). Eventually we realized their castings were exactly what we were looking for. They contain the P and K the plants need, readily absorbable, and can be produced abundantly and at no cost by the families themselves. Between LOF, worm castings and decaying leaves, plants also have enough minor nutrients. An additional environmental bonus: kitchen refuse could be recycled, instead of thrown into the garbage.

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The aim of the project was to benefit families. Consequently, it was proposed to them once results were sufficiently satisfactory, without waiting for perfection. The lack of organic P and K was temporarily supplied with chemical fertilizers. It was important to checkup on their acceptance specially of LOF. In the last four years, the project was implemented among several hundred families in six slum areas of Mexico City.

For this stage, the project received partial financial support from GATE–ISAT in Germany and the St. Nikolaus Foundation in Sweden. A Mexican chain of supermarkets agreed to give the project all their used containers we had to collect them and clean them which was a great boost. We tried, but could not get any support from local Mexican government agencies at that time.

The projects lessons

LOF was easily accepted, even though it was a conclusion reached through a quasi–maieutic dialogue: "We can make an agreement with mother earth, to give her what we no longer need, and ask her to provide us with what we need. What is it that we no longer need? etc"; along with a medical explanation confirming that urine is a clean and pure substance, and properly fermented is harmless.

To be constant in the care of a vegetable garden specially to overcome the difficulties in the early stages –people need to have more than one of the following motivations, amongst others :

- availability of food to improve nutrition,
- economic savings
- a nice hobby for the whole family
- healthier, fresher organic food
- recuperation of agricultural skills –most elders come from rural communities
- closer contact with nature
- increased political independence from government assistance
- ecological concerns: recycling of garbage, containers
- plants as house ornaments
- relaxation from urban stress
- friendship and meetings with other women raising plants.

People were willing to pay a price equivalent to costs for the implementing agency. In turn, during the first year families should harvest produce at least equivalent to the price they paid. This would eventually make the project self–financing.

It was mostly women that were interested in container vegetable gardening. And it is always a community activity. Besides food plants, women from slum areas began to request ornamental flowers and trees. We readily complied.

It is important to work in an organized context, so the implementing agency does not need to bear the burden of organizing people.

There should be relative tranquillity in the community, for people to dedicate enough time to their gardens. If there is political or other kind of unrest, people tend to be distracted and disregard their plants.

Conclusions

Further experimentation with the more complete fertilization system is necessary. In this context, soil pH is a variable that has to be better understood. We also plan more experimentation with worm feed to include substances that could increase the percentage of P and K in the castings.

The project will expand to many more families and slum areas. At this stage some form of government support is likely, to open new areas, and to tackle other aspects of the project such as:

- Utilization of discarded tires turned inside out, to be used as wide mouth containers with greater capacity excellent for root plants. This would also address a staggering ecological problem in a city like Mexico with literally mountains of used tires.
- A shift from an artisan to an industrial production system with several production lines: plants, containers, worms, tires. A drive to reach the financial break-even point, and achieve self-financing for the whole operation.
- Start experimenting with backyard animals.

The project has been successful in perfecting a technology to cultivate vegetables in containers organically, with no industrial external inputs –by utilizing readily available, zero-cost waste matter and discarded containers. It is a sustainable urban agriculture system easy to expand, that can help people recover their autonomous capacity to reach a certain degree of self-sufficiency in food production. But much more needs to be done.

Notes:

Barbara Daniels, Growing Plants in Containers: new guidelines for a deck garden. Multicopied. Fairfax, Ca., 1981. On several occasions the project tried to get in touch with Dr. Daniels, but could never locate her.

Tränkner, Andreas, Kompostextrakte kontra Schadenpilze, in Garten Organisch, 4/1990, pp. 13–15.

Rodrigo A. Medellín Erdmann is a sociologist who has been working with campesino and Indian communities and organizations in Mexico since 1974. He is a co-worker of ANADEGES –"Autonomy, Dezentralization and Self-management" – created in 1982. One of the institutions of the group, Cedicar, manages the project described here.

See also related news under: Eco-exports

Natural Farming and Sustainable Agriculture – Networks and Organisations

In the Focus section of gate 4/90 we presented some organisations concerned with organic farming. In this issue we are updating and adding to this overview by introducing other networks and organisations from Latin America, Africa and Europe which partly have an international angle. The information comes from the organisations themselves.

- * MAELA –Movimiento Agroecologico de America Latina y el Caribe
- * NFN –Natural Farming Network
- * EULEISA –European Network for Low–External–Input and Sustainable Agriculture
- * AGRECOL Information and Networking Center
- * GEYSER –Group d'Etudes et de Services pour L'Economie des Ressources
- * IFOAM –International Federation of Organic Agriculture Movements
- * ILEIA –Information centre for Low–External–Input and Sustainable Agriculture
- * GRAIN –Genetic Resources Action International
- * HDRA –Henry Doubleday Research Association

MAELA –Movimiento Agroecologico de America Latina y el Caribe

MAELA, a movement for the promotion of ecological farming in Latin America and the Caribbean was founded in Cochabamba, Bolivia in 1989 in the context of the crisis in Latin American agriculture. The aim of MAELA is to develop of a socially just, economically profitable and ecologically stable model of development.

The promotion of binding regulations and controls for the production and trade of agricultural products in Latin America is part of the activities of MAELA, as is the training of experts for certain tests and for certification. Also, the movement prepares proposals to advise national and international institutions which have decision-making powers with regard to environmental, agricultural and food-related issues. MAELA promotes political strategies and initiatives which preserve the cultural heritage of the regions and aim for self-sufficiency in food stocks and the participation of the population.

MAELA has a central co-ordination office in Santiago, Chile and five regional co-ordination centres for the region of Cono Sur, the region of the Andes, the Brazilian Amazon, Brazil (excluding the Amazon) as well as Central America and the Caribbean. Cono Sur includes Paraguay, Uruguay, Argentina and Chile, while the region of the Andes covers Bolivia, Peru, Ecuador and Columbia. Central America and the Caribbean covers Mexico, Costa Rica, Guatemala, Honduras, the Dominican Republic and Venezuela.

The co-ordination centres have the task of research, information, training and standards, as well as marketing. MAELA publishes a quarterly magazine with the title "Hoja a Hoja".

Address:

Coordinación General de MAELA

Almirante Riveros 043

Providencia

Santiago

Chile

NFN –Natural Farming Network

The Natural Farming Network is an alliance of 12 Zimbabwean organisations which promotes ecologically, economically and socially sound sustainable agricultural practices.

It is an operational wing of the Zimbabwe Institute of Permaculture and it seeks to reduce farmer dependence on expensive, often harmful external inputs. The objectives of the NFN are to work with member organisations to train agricultural trainers in natural farming techniques and establish working examples of ecological land-use management.

It also strives to collect, review, document and disseminate information on ecological land-use management; to monitor and evaluate initiatives in natural farming; to build NFN management capacity to assist with the development of management and planning strategies of members in relation to natural farming approaches and to facilitate the co-ordination of activities of NFN members.

There are seven major programmes incorporated into NFNs agenda and carried out with or through the member organisations. The programmes are homestead development, model villages, training, research, the schools programme, exchange programmes and Natural Farming book production and distribution.

The homestead development programme works with farmers to design their homesteads in ways that exemplify natural farming principles and practices and instils a feeling of pride and project ownership in the families involved in the programme.

Model villages are similar to homestead developments except they are used as training facilities and are established at member training centres.

NFNs training programme assists member organisations in organic farming, natural farming, holistic resource management and permaculture training. Most training sessions are followed up with exchange programmes and area visits.

Two research programmes are taking place at the moment, focusing on village-based legume research and Endod (*Phytolacca dodecandra*) research.

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The school programme is a pilot project which aims to introduce permaculture into the Zimbabwean school system. This project involves designing school grounds in a way that will increase food and tree production and reduce erosion.

Exchange programmes exist between farmers and extensionists within Zimbabwe and throughout the regions of East and Southern Africa. These exchange visits are designed to motivate farmers and expose them to successful natural farming projects across the continent.

Address:

Natural Farming Network, Zimbabwe

PO Box CY 301

Causeway, Harare

Zimbabwe

Tel: +263 4 726 538

Fax: +263 4 723 056

EULEISA –European Network for Low–External–Input and Sustainable Agriculture

EULEISA is a network of European organisations promoting Low–External–Input and Sustainable Agriculture (LEISA) by smallholders in tropical, subtropical and Mediterranean areas. It was founded in 1991.

EULEISA includes organisations which advocate purely organic farming as well as organisations which advocate sustainable forms of agriculture which make limited use of external inputs in combination with optimal use of local resources.

EULEISA members work together with governmental and non–governmental organisations, development projects, farmers associations and information exchange networks in Africa, Asia and Latin America.

In January 1995 EULEISA had 12 members and associates, including GATE/ISAT. Six members responded to requests for information on their activities with the following profiles:

AGRECOL Information and Networking Center

The AGRECOL Information and Networking Center was founded in 1983. Our main aim is to produce ecologically sound and sustainable agriculture for small–holders in Africa and Latin America, with a clear bias on West Africa and the Andean countries.

AGRECOL is collecting, documenting and disseminating practical information on activities and experiences in sustainable agriculture, appropriate communication methods and participatory approaches to rural development. We are also supporting organisations in the South promoting exchange and cooperation among

NFN –Natural Farming Network

them.

We are financially supported by governmental and private developmental agencies in Switzerland and Germany.

We are addressing our activities primarily to multipliers such as extensionists, development workers and experts who are working with peasant farmers in agriculture rural development.

We are running a specialized documentation and networking service and are currently in the process of regionalizing our services to Senegal and Bolivia.

Among several useful bibliographies and practical publications, AGRECOL has since 1992 been editing ACACIA, the "Circular Letter of Friends of Sustainable Agriculture in Africa" (in English and French, three to four issues published annually). ACACIA serves as an exchange forum for practitioners. In Latin America AGRECOL participates in the edition of Hoja a Hoja, a magazine for information exchange of the agroecological movement MAELA.

Address:

AGRECOL

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CH-4438 Langenbruck

Switzerland

Tel: +41 62 601 420

Fax: +41 62 601 640

GEYSER –Group d'Etudes et de Services pour L'Economie des Ressources

GEYSER is a French NGO which was founded in 1983 by a group of agronomists who generate and disseminate information on sustainable agriculture. The current focus is on topics such as the alliance between producers and consumers in order to facilitate the marketing of agricultural products, the preservation of bio-diversity and the support of the North-South exchanges by changing the mechanisms of co-operation and promoting communication on shared problems.

Geyser runs two databases "Alteragri" (in co-operation with the Institute Technique d'Agriculture Biologique, ITAB) and "Agrinnov". In order to facilitate the diffusion of information "a la carte", Geyser-ITAB has started pilot projects on the analysis of different information needs.

The group participates in the publishing of various magazines such as the "AlterAgri" which is a magazine of the ITAB, appearing three times a year in French about alternative farming; the Mexican biannual journal "Pasos", which reports in Spanish about topics on rural development; and "Spore", the journal of the Centre de CoopÃ©ration Technique Agricole (CTA), distributed in countries in Africa, the Caribbean and the Pacific.

GATE – 3/95 – Sustainability in smallholder agriculture

Geyser organises international workshops on various aspects of sustainable agriculture mainly with partners in Latin America and the Mediterranean region.

Address:

Geyser

F–30260 Corconne

France

Tel: + 336677131133

Fax: + 3366771206

IFOAM –International Federation of Organic Agriculture Movements

IFOAM was founded in 1972 and coordinates a network of movements around the world which promote organic farming. Its major activities involve exchanging knowledge and ideas, informing the public, representing the organic movement in international forums, for production, processing and trade of organic products. The IFOAM basic standards have been translated in 17 languages! IFOAM now has about 500 full member organisations in 100 countries.

In addition to its Internal Letter, IFOAM publishes the quarterly Ecology and Farming in English with Spanish and French abstracts. A major tool for the international network is the IFOAM directory Organic Agriculture Worldwide. In addition the federation publishes numerous books, mostly proceedings of its conferences. Governed by a biannual General Assembly and World Board of Directors, IFOAM is now decentralising its organisational structure to better meet the needs of its membership in each continent.

IFOAM has set up a WWW server in Copenhagen/DK in preparation of the 11th IFOAM Scientific Conference, 10–15 August 1996, Copenhagen, Denmark.

Address:

IFOAM

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D–66636 Tholey–Theley

Germany

Tel: +49 6853 5190

Fax: +49 6853 30110

NFN –Natural Farming Network

ILEIA –Information centre for Low–External–Input and Sustainable Agriculture

Since 1982 the information centre has collected and disseminated information on agriculture that optimises the use of locally available resources and uses external inputs in a complementary and efficient way.

LEISA involves practices of soil and water harvesting, agroforestry, integrated pest management, intercropping, crop–livestock integration, microclimate management and the use of local species of animals and plants in food production.

The approach builds on a combination of farmers local knowledge, ecologically oriented agriculture developed elsewhere, and scientific insights into agro–ecology. LEISA is not a blueprint.

In a process of Participatory Technology Development (PTD), farmers and other professionals combine their particular strengths to find the type of LEISA which is ecologically and socio–ecologically appropriate for the given site.

Activities of ILEIA are:

- Publications include the "ILEIA Newsletter" (a quarterly magazine), the "PTD Circular" (half–yearly), books (occasionally), bibliographies and registers of organisations and individuals
- Documentation: ILEIADOC, a library database containing literature on LEISA and PTD
- Collaborative Research and Information Programme: institutional and research support to networks of farmer organisations, NGOs, and research institutes in three regions.

Address:

ILEIA

Attn. Carine Alders/Wietse Bruinsma

PO Box 64

NL–3830 AB Leusden

The Netherlands

Tel: +31 33 943086

Fax: +31 33 940791

e-Mail: ileia@antenna.nl or ileia-nl@geo.geomail.org

GRAIN –Genetic Resources Action International

GRAIN was established at the beginning of the 1990s to launch a new decade of popular action against one of the most pervasive threats to world food security: genetic erosion.

GRAIN aims to:

- Stimulate public awareness about the importance of genetic resources for society, and about developments and factors that threaten this diversity
- Increase knowledge and understanding about structural causes behind the destruction of biological diversity
- Stimulate activities and policies that lead to a better conservation of genetic diversity at the local, national and international level with a special focus on the interests of the poor in developing countries
- Support the activities of individuals and public interest groups, such as Third World, consumer, environmental, farmers and church–linked organisations, as well as trade unions, lawyers and researchers, concerned about these issues and facilitate communication and cooperation between them.

Examples of our information work include the publication of "Seedling", our quarterly newsletter on genetic resources and biotechnology, and the quarterly "Biodiversidad", edited with REDES–AT of Uruguay for Latin America.

We also publish a wide range of books and reports.

Address:

GRAIN

Girona 25, principal

08010 Barcelona, Spain

Tel: +34 3 301 13 81

Fax: +34 3 301 16 27

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HDRA –Henry Doubleday Research Association

The HDRA is the prime centre for organic horticultural research in the UK, working to improve methods of organic growing and to promote organic cultivation as the sustainable, safe and sensible approach to growing. The HDRA also assists hundreds of projects in developing countries involved in sustainable agriculture and agroforestry.

GATE – 3/95 – Sustainability in smallholder agriculture

A Tropical Organic Advisory Service, run from the UK, provides advice and extension literature, for which there has been a huge demand from NGOs and other organisations who find it difficult to get access to global information sources.

The HDRA recognise, however, the need to set up regional centres to provide global information for local interpretation and have, at present, identified Ghana as being a suitable location for such a centre. A detailed pilot study has involved working with a number of groups in Ghana to discover the current position of, and need for, an organic agriculture and agroforestry advisory service.

Watch also on a server in the UK for additional information on HDRA!

Address:

HDRA

Ryton Organic Gardens

Ryton-on-Dunsmore

Coventry CV8 3LG, UK

Tel: +44 1203 303 517

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Organic cocoa production in Ghana

TOFA –the Traditional Organic Farmers Association in Ghana advises organic cocoa growers and other farmers committed to organic agriculture. Sampson Anobah from TOFA has compiled some practical recommendations for cocoa growers:

Organic cocoa growers should not depend only on cocoa for their livelihood as there are times of unfavourable harvests depending on the season, and also price fluctuations. Cocoa is a seasonal crop yielding no returns during the off season. It is therefore advisable for organic cocoa growers to diversify their crop production to be self supporting throughout the year.

Organic cocoa should be grown under an agro-forestry system of farming, whereby indigenous rain forest trees already existing in the eco-system are preserved. Of course some weak and undesirable trees are felled and valuable hardy trees such as lumber, wild spices, oil bearing and medicinal trees are left untouched. Apart from preserving the ecology, offering high shade for the cocoa trees, acting as wind breaks, etc., their deep roots tap leached soil nutrients from the lower reaches of the soil to effect nutrient recycling when the trees shed their leaves.

Plant diseases:

Swollen Shoot Virus Disease is the major plant disease of cocoa and could devastate a whole cocoa plantation. Mealy bugs are the vectors which transmit the virus from an infected tree to a healthy tree. There is no cure and infected trees should be cut by the roots and destroyed. Re-planting of the area should be carried out after a series of re-inspections for infected trees and some months have lapsed since the last treatment. Parasitic plants such as mistletoe which parasite on cocoa should be removed and burnt.

To reduce the threat of black pod fungal disease, infected pods and squirrel damaged pods should be removed and not left hanging after the seasons crop. Excessive shade could create dampness and induce the growth of fungus. Frequent weeding, reduction of shade and the removal of unwanted basal chuppons of cocoa promote aeration, sunlight penetration and reduce black pod fungal disease on cocoa.

Bordeaux mixture is permitted for the control of fungal diseases in organic farming. However, as prevention is better than cure, applications are recommended whenever cultural practices fail to prevent fungal diseases. Bordeaux mixture is perhaps the most important and most commonly employed fungicide in organic farming. It consists of copper-sulphate, lime, and water, in various proportions, according to the strength required.

Insect pest control:

Two methods could be applied: kerosene emulsion application or biological control.

Kerosene emulsion is a contact spray which kills by clogging the respiratory organs and is used for insects which obtain their food by sucking juice, e.g. plant bugs, scale-insects, etc. and for which stomach poisons would be ineffective. Kerosene emulsion is one of the most effective sprays against scale insects and bugs, e.g. capsid, and it is prepared by mixing kerosene with soap and hot water to form an emulsion.

Kerosene emulsion/tamarind seed is a very effective spray against bugs on organic cocoa and organic coffee. Only 1 kg of tamarind seed is required in 250 liters kerosene emulsion. Spray at two weekly interval when new flush leaves appear and capsid bugs are active sucking the sap of young shoots. Continue to spray fortnightly until the new flush leaves harden.

It has been observed that Red Tree ants protect the host tree on which they live from insect damage as they attack insect pests that visit the tree. So encouraging the breeding of Red Tree ants on organic cocoa plantations promotes biological pest control. This is done by transferring the nest of fold up leaves containing the queen (reproductive) Red Tree ant to a tree on which there are no such ants. The nest borne on a branch is tied to a branch, and the queen starts to breed a new colony on the host tree.

Cocoa processing and solar drying:

It is important to harvest organic cocoa as soon as the cocoa pods are ripe. Holding on for a long time might cause loss of weight, germinated cocoa beans, squirrel damage and fungal infestation. Organic cocoa should be processed a few days after harvesting by breaking the pods, stock piling the beans on banana leaves, covering them and leaving them to ferment for about four days, i.e. until the fifth day that the cocoa beans have been heaped up for fermentation. At the time of breaking the cocoa pods, permeated and mouldy cocoa beans should be discarded. The placenta bearing the cocoa beans are removed on the third day of fermentation. The beans are covered again to complete the fermentation process.

Best dried organic cocoa, free from mould and foreign matter, is derived from solar drying the cocoa beans. Samples of organic dried cocoa and a model of a multipurpose solar dryer for drying organic cocoa and staple food crops and spices can be seen at TOFA/GTZ-GATE Solar Drying Centre at Yensiso-Akuapem village in Ghana. It would be of immense benefit for each peasant organic cocoa growers society to own a community solar dryer constructed with local materials, to reduce cost and to improve the drying quality of organic cocoa

and also to distinguish it from sun dried cocoa.

Address:

Traditional Organic Famers Association, TOFA

P.O. Box 71

Mampong –Akuapem

Ghana

Report

Plastics recycling in developing countries; A booming business?

by Inge Lardinois and Arnold van de Klundert

In developing countries, and particularly in Asia, the recycling of plastics derived from waste materials is thriving, as our authors argue, based on their research on solid waste recycling options. Plastics recycling can generate income and employment.

The plastic recycling boom is due to a combination of factors:

- High unemployment and low labour costs mean that the labour-intensive manual processes involved in the reprocessing of waste plastics, such as collecting, washing and sorting waste, are economically feasible.
- Because of the large numbers of low-income consumers, the level of market acceptance of cheaper, poorer-quality products is high.
- The use of plastic waste instead of raw materials such as crude oil or virgin plastic pellets means that production costs are reduced considerably.
- There are few or no regulations or quality standards for recycled products.

In contrast with the industrialized countries, most plastics in developing countries are reprocessed in (so-called informal) small enterprises that depend almost exclusively on recovered materials. For many people, working in the informal waste sector is the last resort in their daily struggle for survival.

Nevertheless, a large number of traders and reprocessors have managed to set up businesses that generate reasonable or even high profits. The technologies they use are in principle the same as those used in the (formal) large industries, although most machinery is outdated or has been upgraded with locally available

spare parts.

Given their small size and the large proportion of scrap they use, these enterprises are highly dependent on a network of dealers and reprocessors for supplies of raw materials that meet their specifications.

The four types of plastics that are most commonly reprocessed are polyethylene (PE), polypropylene (PP), polystyrene (PS) and polyvinyl chloride (PVC).

Chain of activities

Sorting waste plastic at a Bangkok refuse dump.

Photo: WASTE–Consultants

Plastics recycling consists of a chain of activities. The initial stages of collecting, cleaning and sorting are labour-intensive and require low capital investments and little or no specific technical skills.

The collected waste materials can be reduced in size by cutting them up with scissors or using techniques such as shredding or agglomerating. Size reduction reduces the bulk of the material, thus reducing transport costs, and facilitating feeding the plastics into machines for further processing.

These further reprocessing stages consist of mixing, extrusion, pelletizing and product manufacturing. An extruder produces spaghetti-like strings that are cut into pellets (small, regularly shaped grains of uniform size) suitable for continuous feeding into manufacturing machines. Product manufacturing processes are for example extrusion, injection moulding, blow moulding and film blowing. These processes are based on extrusion techniques, in which either the form of the dies or the blowing technique determines the shape of the end product.

Collecting and sorting

The initial stages of collecting and sorting the waste materials are performed by waste pickers (who usually operate on an individual basis), and scrap-dealers. In the later stages of size reduction, mechanical washing and drying, pelletizing and product manufacturing, small industries become involved. However, no clear distinction can be made between the various entrepreneurs involved in either the initial or the further processing stages.

For example, small manufacturing workshops may also be involved in the initial stages, such as the selection of materials according to the type of polymer, or colour, in addition to the preselection by waste pickers and dealers. The different stages in plastics recovery are closely interlinked, and extensive networks exist between the various entrepreneurs involved. In general, women and children are especially involved in the initial stages, whereas men tend to be involved in pelletizing and product manufacturing activities. Waste reprocessing enterprises also provide work for a number of craftsmen, electricians and fitters, who carry out critical tasks in maintaining the production process.

The initial stages of collecting and sorting waste generate most employment. In Metro Manila, for example, it has been estimated that as many as 7,000 individuals are economically fully dependent on plastics recovery activities such as sorting, cleaning and drying (CAPS, 1992). In some cities a large number of small reprocessing workshops exist.

In Manila, the plastics industry comprises more than 450 companies, the majority of which are small to medium-scale manufacturers who use reprocessed plastics in their production processes (CAPS, 1992).

Another example is the plastics reprocessing industry in Cairo that consists of 450–500 workshops and small factories that use a variety of recycling processes (EQI, 1991).

Wages within the recycling sector vary a great deal according to the type of work performed. Usually the dealers and workshop owners earn more than the waste collectors and contract labourers. An example from Calcutta (based on data from 1991) illustrates these differences (see Box).

Different markets demand goods of different quality. First, there is the demand for regular or good quality products from high-income consumers and more specialized markets: such products incorporate only small proportions of recycled waste plastics (5–20%). Second, there is a high demand for lower-quality products made of recovered materials, which are sold at lower prices.

Wages within the plastic recycling sector

Waste pickers in Calcutta belong to the poorest section of society, and are the primary collectors of refuse materials. They earn only 25 cent per day, which is below the local subsistence level. The itinerant waste buyers work in cleaner environments, collecting specific items from housewives and commercial premises. They earn approximately 50cent per day, which is marginally above the subsistence level.

Contract labourers, who also belong to the poorest section of society, usually earn between 50 and 70 cent for a 10–12 hour day, depending on whether they are male or female, adult or child. The earnings of primary dealers vary between \$50 and \$70 per month, whereas secondary dealers earn about \$100 per month. According to locally acceptable income and living standards, the dealers are reasonably well placed and have acquired a certain social status. The supervisor of a reprocessing workshop can earn about \$40 per month.

Source: Ptr Services. A report on waste recycling in the city of Calcutta. WAREN project, WASTE Consultants, the Netherlands, 1992.

This difference in demand is clearly demonstrated in Turkey for example, where both regular water pipes and a low-quality version are manufactured. The regular, high-quality version is manufactured from virgin polyethylene and is pale blue in colour. This version is destined for use in the formal market in the construction of new apartments, shops and office buildings. The lower-quality version made of reprocessed polyethylene is black, due to the mixture of differently coloured waste plastics; such pipes often vary in thickness, with thin patches that may be porous. These pipes are sold for example in rural villages in Anatolia, in the east of the country, for use in housing and as irrigation pipes (Konings, 1989).

The viability of a waste plastics recycling plant will depend upon a number of important technical factors, and socio-economic and political circumstances. Macro-economic factors such as international prices and trading policies, government policies (including import restrictions), and municipal policies related to solid waste management will all determine the level of recycling that is feasible. Also, a well-developed indigenous plastics processing industry is crucial for the feasibility of plastics reprocessing enterprises. The informal plastics recycling sector often flourishes alongside the formal industries. Some small-scale entrepreneurs receive their training within the formal sector, and the availability of second-hand machines and locally manufactured equipment means that huge savings on capital investments can be made.

Health hazards

In low-income countries many informal recycling activities do not comply with labour and health regulations. The lack of safety arrangements and precautions, together with the polluted atmosphere in many working areas, may present serious health hazards, particularly for the workers themselves, but also for residents in the neighbourhood of the units. The environmental and health risks arising from plastics recycling are different for each stage of reprocessing, but in general, plastics contaminated with unknown substances and mixed plastic wastes pose the greatest dangers to human health and the environment.

The quality of the final products derived from waste plastics will be improved considerably if all contaminants (non-plastics, dirt, etc.) are removed prior to reprocessing, and if the degree of moisture is reduced to a minimum. It is also important that the different types of plastics are separated as carefully as possible and as close to the source of generation as possible (e.g. collecting plastic waste from houses, offices and industries instead of from landfills). Thus the waste plastics should be sorted, washed and dried, preferably before size reduction. Also, working conditions will be improved considerably if the waste plastics are washed and dried before they are sorted.

Growing demand

In many economically less developed countries the prospects of the plastics reprocessing industry are good, mainly because the demand for plastic products is growing, and so are the amounts of plastic waste being generated as a result. The amounts of plastic waste have increased considerably in developing countries and have reached levels, for example in South East Asia and the Indian subcontinent, similar to those in Western Europe and the United States. In 1982, in Metro Manila in the Philippines, plastics accounted for 7.5% of the weight of solid waste generated. By 1990, this proportion had increased to 12.4%. These figures do not include the waste generated by the plastics industry itself, since this is sold directly to recyclers (CAPS, 1992). According to data from the Association of Plastics Manufacturers in Europe (APME), in 1990 plastics accounted for 7.3% (by weight) of the municipal waste generated in Western Europe.

Painting plastic products in India.

Photo: Johannes OdÃ©

Also, possibilities exist for setting up new enterprises. If there is no local tradition in small-scale manufacturing of consumer goods, short-term successes may be easier to achieve by initiating activities such as collecting, washing and sorting plastic waste materials rather than product manufacturing.

In setting up and maintaining small enterprises, it is essential to establish business links with formal large-scale industries. First, they could be interested in buying semi-processed products, such as clean and sorted shredded plastic materials or pellets. Second, these industries are becoming more interested in contributing to employment generation on the one hand, and recycling on the other to build up a social and green image. Small enterprises may be able to benefit from these tendencies and to take advantage of the expertise available within these industries.

Prevention first

The best way to prevent environmental and health problems caused by waste would be simply to avoid the generation of waste in the first place. Prevention should always be an important first measure. This is especially true for high-income countries where, for example, the packaging industry uses plastics unnecessarily and where literally hundreds of types of plastic materials are available commercially. But it also applies to developing countries. In economically less developed countries, fewer types of plastics tend to be

used than in industrialized countries. In Calcutta, for example, approximately 17 major types of plastics are used for general applications, and there are more than 50 minor types, called grades (Ptr Services, 1992). The larger the number of plastic types, the more difficult it is to sort and the worse the quality of the products. Restricting the number of plastic types is therefore an important measure. But plastics continue to be produced and recycling is an interesting option for handling this waste.

See also related news under: Urban Solid Waste Series

Positive benefits

Plastics recycling definitely has some positive benefits: it can generate income, it requires relatively low levels of investment, it can yield reasonable or high profits, and involves relatively technically uncomplicated production processes to produce a wide variety of products for a broad market. Also, local governments benefit from recycling activities, because less waste has to be collected and disposed of. Local governments could play an active role in stimulating the growth and improving the performance of these enterprises by:

- Recognising and integrating existing informal recycling networks within municipal solid waste management systems
- Stimulating the development and implementation of appropriate technologies for plastics recovery
- Formulating policies to protect and encourage the horizontal growth of small-scale resource recovery initiatives
- Creating legal frameworks and control mechanisms that will both improve safety in the workplace, and protect the environment
- Disseminating information both to the general population and to enterprises on the benefits of recycling and the prevention of waste generation.

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Vertical shaft brick Kiln, Peshawar

Environmentally friendly technology

by Thomas Neumaier

Technology transfer takes on many forms. Transfer and exchange of technologies takes place not just from the North to the South but also from the South to the South. If this transfer of technology takes place for environmental protection, it has even more importance. One example, which has just produced its initial results, is a project initiated by GATE on brick production.

In 1989 and 1990 three Chinese technicians built a vertical shaft brick kiln in Nepal, financed by the GTZ. Because of energy savings amounting to about 50%, a second oven was later built. (The field-staff officer in charge, Henrik Norsker, reported about the project in detail in gate 4/91). This technology has now found its way from Nepal to Pakistan.

The Vertical Shaft Brick Kiln in Peshawar.

In the North West Frontier Province (NWFP) the idea from Eschborn to test and improve the Chinese technology fell on fertile soil. There, Pakistani experts under GTZ management had for years been working on fuel-saving technologies in the household, in particular in the area of fuel-saving cooking stoves, fuel-saving heating stoves and fuel-saving bakeries. Therefore, it was an easy task to integrate the Chinese Vertical Shaft Brick Kiln technology into the existing work programme. The first results in 1993 and 1994 were so promising that the GTZ decided to work from the beginning of 1995 exclusively on this technology in the framework of the Study and Experts Fund. Today, the "VSBK Development Project, NWFP", based in the northern Pakistani border town Peshawar, has tested, further developed, improved and checked the kiln to an extent that the product "VSBK-Peshawar" will be on the market in autumn this year.

The product

The product is a vertically constructed kiln (VSBK). It has three zones, the central firing zone and two side insulation zones. At the top eleven or twelve batches of 178–188 green bricks (unbacked bricks) are stacked in a shaft measuring one meter by one meter, with a height of 5.25 m. Each batch is made up of four layers. Powdered coal is spread out evenly between each layer of bricks.

The ignition is started at the bottom of the shaft by lighting fire among the bricks. The combustion air enters at the bottom of the shaft and moves up through the already-fired bricks. By the time this air reaches the central firing zone it is preheated up to 850–900 degrees centigrade. The heat stored in the bricks is reused to fire the next set of bricks in the firing zone. After combustion the hot flue and exhaust gases move up to preheat the green bricks. The temperature of the exhaust gas, when it reaches the top is quite low, about 90–100 degrees centigrade. Throughout the operation of the VSBK the bricks are moving while the fire and heat is static.

Advantages

Each time bricks are stacked at the top, a batch is unloaded at the bottom. Each batch of bricks rests on six supporting iron bars. For unloading the trolley is raised with the help of a five ton chain pulley or screw jack and the bars are removed. The trolley is then lowered and pulled out for unloading. On average one batch is unloaded every 2.5–3 hours. The VSBK can be continuously operated for 24 hours a day and under certain

circumstances the kiln can be operated 12 months a year, so including the rainy season.

The existing Vertical Shaft Brick Kiln technology, which is now in operation in northern Pakistan has many advantages in comparison to the traditional kilns. The most relevant advantages are:

- Fuel saving of around 30–50%
- Air pollution is reduced substantially due to 30–50% reduced fuel consumption and hence clearer combustion. During operation no black smoke is seen from the chimneys
- 60% less land is required for the kiln. A two-shaft VSBK requires only 25 sq. meters of land
- Maintenance costs are less
- Transportation costs are reduced due to non-usage of wood fuel
- VSBK can be operated in rainy seasons
- Its operation is easier to learn and apply
- Use of firewood and old tyres is excluded.

The results of tests on the economics and profit margins in Peshawar are very positive. First of all the VSBK–Peshawar requires only 25 sq. meters of land for a two-shaft kiln. This means that for a six-shaft kiln which is comparable with a standard size traditional kiln only 100 sq. meters are needed. For a so-called Bulls Trench kiln, the traditional kiln, a minimum of 700 sq. meters are needed. This is a very important point, because land is increasingly expensive in the areas surrounding the cities of Peshawar, Lahore, Rawalpindi etc.

Production of bricks.

Higher profit margins

The construction of a two-shaft vertical shaft kiln requires 48,500 bricks, six sq. meters of roofing with the necessary wood, two five ton chain pulley systems, an unloading trolley and rails. The construction cost (all technical equipment and devices included) of a two shaft kiln is Rs 150,000 (US\$ 5,000).

This initial investment is higher than for a traditional kiln, but this investment can easily be recovered in a short period, because profit margins are much higher than in a Bulls Trench kiln, due to 30–50% less fuel consumption and 12 month continuous operation. The traditional kiln can only be operated in the dry season, so in Pakistan for not more than eight to nine months a year.

The net profit with the VSBK–Peshawar, per fired brick is Rs 0.20. Taking into consideration that 24,000 bricks can be produced in 24 hours, the net profit is Rs 4,800 (US\$ 160). This is 40–50% more than with a traditional kiln.

The prospects

The new technology for burning bricks, developed in northern Pakistan and based on the vertical shaft system, could have an revolutionary impact. This does not only apply to Pakistan, but also to other countries in the world where restraints are already in force due to environmental pollution. This energy-saving and environmental technology cannot work without some minimum requirements, however. One of these is high quality coal with a high burn value. This could be difficult in some countries, as it is in China. But the use of high quality coal is also a good approach to environmental protection.

The brick burning technology which was originated in China and further developed in northern Pakistan is worth promoting. In particular because it allows small investors and brick manufacturers with little capital to set up their own equipment, which bears some higher investment costs but is substantially cheaper in terms of running costs than any traditional equipment.

Dissemination

On average one batch is unloaded every 2.5–3 hours.

Photo: GTZ–VSBK Project

The brick shaft kiln VSBK–Peshawar is of great interest all over the country. Even during the testing and assessment phase of the project two Pakistani private investors built a two-shaft kiln with their own capital but using the know-how of the project. Using slogans like "build your economy", "protect your environment" and "say yes to the vertical shaft brick kiln" the project is already highlighting new energy-saving and environmentally friendly technology in Pakistan. In autumn 1995 the Pakistani Environment Protection Agency (EPA) of the North West Frontier Province will take over the product from the GTZ and begin the dissemination of the technology.

Until then the project will work on a promotion and dissemination concept for the EPA. The EPA in Peshawar and the German project management are confident. By the time new legislation which bans environmental pollution by brick kilns comes into effect on 1 June 1996 at least 20 environmentally friendly brick manufacturers will have replaced the traditional ones. This is only a drop in the ocean, since there are about 400 brick manufacturers around Peshawar, but it is a good start.

Those who want to know more about VSBK–Peshawar or are interested in building one themselves, can ask for construction plans, a construction manual, an operating manual and other detailed information from:

GTZ–VSBK Development Project

P.O. Box 896

University Town

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Thomas Neumaier is project manager of GTZ–VSBK Development Project.

Introducing AT Forum

TaT Transfer Centre for Appropriate Technologies and InterRed cooperaci3n

17 organisations have joined the AT Forum NGO–GTZ. The last four issues of gate introduced 14 organisations. TaT, which is portrayed in this issue, is a technology centre which supports small and medium–sized companies in Germanys largest federal state, North–Rhine/Westphalia and also in developing countries and in Central and Eastern Europe. The InterRed cooperaci3n association chiefly supports energy projects in Cuba.

TaT Transfer Centre for Appropriate Technologies

A solar house with a solar–active roof area (collectors and photovoltaic cells) which turns towards the sun, driven by a 20 KW electro–motor.

The Transfer Centre for Appropriate Technologies (TaT) in Rheine, is a small non–governmental organisation (NGO) founded in 1992. The shareholders of the TaT limited liability company are the City of Rheine and an association with members from all parts of society. TaT is a private–public–partnership with a diversified membership–structure of over 120 small–and medium–sized enterprises, research institutes, banks, associations und communal institutions.

The construction of the centre has been subsidized by the North Rhine–Westphalian State Government; the running costs (e.g. for our 15 employees) have to be financed by income generated through our activities. The annual turnover of about 1.5 Million DM is composed of office rents from companies located within TaT; fees for seminars in our training centre; membership fees; projects financed by different donors (e.g. State and Federal Ministries and NGOs, European Union).

Objectives and activities:

TaT is one of over 150 technology centres in Germany. The overall objective of these centres is to support structural change within the regional economy by promoting new technologies. Every centre focuses its activities on the promotion and dissemination of a few selected "new technologies".

TaT specialises in the promotion and dissemination of appropriate, ecologically and socially compatible technologies both in Germany and in the Third World as well as in East Europe. Most important are technologies that improve the environmental situation. Currently, our most important topics are renewable energies (based on sun, wind, water and biomass), biomass as an industrial resource (e.g. rape seed–based hydraulic oil), ecological construction of houses technology assessment (e.g. for "virtual reality" computer programmes) and life cycle analysis (e.g. for hydraulic oils).

TaTs activities aim at transferring technologies from the research and development side (offered by universities, research institutes, enterprises) to the potential customer side in Germany and abroad (demand by private individuals, organisations or companies and by the public sector). Thus, within our specialization, we

– organise seminars, workshops, fairs and permanent working groups

GATE – 3/95 – Sustainability in smallholder agriculture

- publish studies and reports
- serve as a business start-up centre offering suitable office space at reasonable prices
- propose consultancy to our member companies, generate political support and public acceptance for new technologies
- cooperate with other technology centres within national and regional networks.

The North–South Cooperation Desk:

TaT does not only promote the dissemination of appropriate technologies in Germany. In cooperation with our partners in the Third World and Eastern Europe we assist in building up local technological know-how and capacities. The objective is to enable our partner organisations to develop, adapt and disseminate technologies appropriate to the specific social, economic, cultural and environmental background of the respective country or region. The transfer of technology by TaT member companies and research institutes – either in the form of products or as know-how transfer – is intended to strengthen this process.

The TaT North–South Cooperation Desk proposes several services:

TaT Business Advisory Service:

TaT promotes business cooperation in the field of appropriate technologies and environmental protection. Small–and medium–sized German enterprises as well as private sector companies and NGOs in Third World countries receive our support concerning requests for specific technologies and suitable business partners.

TaT–Training:

TaT organizes in its own training centre seminars and workshops dealing with environmental protection and appropriate technologies for both German and international target–groups.

TaT–Projects:

TaT assists Third World countries in the transfer of appropriate technologies (environmental protection, renewable energies, etc.) as well as in the development of own scientific, technical and management capacities and know-how. Several TaT projects have been realized with the financial support of the North Rhine/Westphalian State Government or are currently under consideration.

Zimbabwe:

Equipment of a rural secondary school with technical equipment for the physics, chemistry and biology laboratories; Training and Demonstration Centre for Appropriate Technologies equipment for community model gardens for womens groups.

Vietnam:

Regional study on the potential for introducing renewable energies.

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In line with its philosophy to disseminate environmentally and socially compatible technologies, numerous eco–buildings have been set up on the TaT site. The electricity supply for this main building comes from the 60 KW wind power plant. The public grid supplies electricity when there is not enough wind.

InterRed cooperaci3n e.V.

The network InterRed cooperaci3n e.V. (InterRed) is a public benefit association based in Frankfurt am Main. For the last three years it has been promoting projects in Latin America, focusing on Cuba. The 24 members of the association, all working for InterRed on a volunteer basis, mostly come from technical and social–welfare callings.

InterReds activities centre on projects which develop and transfer appropriate technologies, chiefly energy production technologies to be the basis for agricultural production and social services such as health care and education.

Cooperation also covers training for counterparts on–site so as to guarantee project sustainability. InterReds aim is to intensify South–South–networking and an interchange of experience with project organisations in other Central American countries. Cooperation between Cuba and Nicaragua is presently being initiated. A basic principal for project promotion by InterRed is that projects have a high level of local input which exceed external assistance.

InterReds project budget of c. DM 0.5 million is obtained from donations and grants from sources such as the Federal State of Hesse and the European Commission. Rapid and bureaucratic support is a prime principle.

Ongoing or scheduled InterRed projects include:

Wheelchair workshop ACLIFIM in Havana:

Spare parts which cannot be locally obtained are procured and delivered to a wheelchair workshop in Cuba. The workshop is operated by the ACLIFIM Association of Physically Handicapped. The support ensures that the urgently required wheelchairs can be regularly repaired. InterReds support also includes identifying and

transporting special medical apparatus for individual cases.

Networking of mini-hydropower stations:

Although mini-hydropower stations are operating in more than 150 locations in Cuba, the energy generated cannot generally be fed into the national grid because electricity lines are not available. The project aim is to interlink the power stations. Four mini-power stations in the provinces of Santiago and Guantanamo have been connected to the grid to date, enabling schools, health centres and housing units for several hundred families to be supplied with electricity.

Biogas dissemination programme:

Biogas plants can be a valid source of energy, particularly for rural populations. They also preserve forests by reducing firewood consumption. 16 biogas plants are operational in the provinces of Matanzas and Villa Clara and also in Havana. As back-up support, 14 Cubans have been trained as biogas specialists to maintain the plants.

Training also addresses craftspeople such as masons, who are needed to build biogas plants. Upstream public relations activities ensure active participation by the population in constructing and using the biogas plants.

Numerous applications have been filed at InterRed for the installation of additional biogas plants and the association is presently looking for financing.

Sewage treatment:

One project incorporated the biological purification of wastewater from the "Echeverría" sisal factory which units wastewater quantities equal to that generated by a town with 150,000 inhabitants. The biogas obtained covers the energy needs of a neighbouring hospital.

Other biogas plants are scheduled, for example to supply energy to hotels.

Projects assisted by InterRed to date are based on the following principles:

- In order to ensure that plants are chiefly made from the materials and with the skills and knowledge available in the country, only an absolute minimum transfer of technology and materials is supported.
- The societal and occupational groups relevant for the projects are involved in planning and implementation.
- Local partners bear responsibility for maintenance, repair and operation at the plants, although they receive support from InterRed if necessary.
- Projects eligible for InterRed support address multiple needs. In the case of biogas plants, for example, these include shortage of energy and the inherent forest destruction, and lack of fertilizer for agricultural production.
- Projects promoted by InterRed also help ensure that the social achievements of a country like Cuba can be upheld despite the difficult supply situation. The siting of biogas plants is an example for this.

They cover the energy needs of canteens to supply meals to company staff or an agricultural cooperative. Energy supplies to schools, hospitals and other social institutions can also be improved.

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AT Activities

- * The Porto Santo solar seawater desalination plant has proven its worth
- * The equipment management cycle: A new tool for planning health care technical services
- * Regional information service centre for South–East Asia on appropriate technology
- * South–South dialogue: SIATA workshop in the GTZ

The Porto Santo solar seawater desalination plant has proven its worth

Berlin –A solar seawater desalination plant has been in operation for more than ten years now on the Portuguese Atlantic island of Porto Santo. It is the only solar–powered seawater desalination plant in Europe today.

The plant was set up as part of a joint research project between the Technical University of Berlin, the Portuguese Regional Civil Engineering Institute LREC (Laboratrio Regional da Engenharia Civil) and the Deutsche Gesellschaft fr Technische Zusammenarbeit (GTZ) who commissioned the work. It consists of four 15 m² basins each constructed to 50% along the lines of the tried and tested greenhouse procedure and 50% according to the procedure of the Interdisciplinary Project on Appropriate Technology (IPAT) developed at Berlin Technical University. The goal of the project was to compare the costs and performance of this newly developed plant with those of traditional desalination plants.

Solar seawater desalination plant on the Portuguese Atlantic island of Porto Santo.

The Portuguese side was able to contribute its own experience with greenhouse-type plants on the Capverde Islands, and participated in the construction and with personnel costs.

The greenhouse-type solar desalination plant was first developed by the Swedish engineer C. Wilson in 1872 in Las Salinas (Chile). The plant consists of basins filled with seawater and lined with a black foil which absorbs the sun's rays. Each basin is covered with a light airtight glass roof construction.

The sun's rays pierce the cover, warm the seawater and provide energy for evaporation. The moist warm air circulating above the seawater is cooled by the transparent cover. The resulting condensation is collected and directed into a container.

In Europe at the beginning of the 1960s, Prof. A. Delyannis of the Technical University of Athens used this procedure, when an American foundation financed the construction of this type of desalination plant on Greek islands. He developed a plant type which was used on Greek islands and abroad over an area of c. 30,000 m². This design was chosen as a comparison.

The central idea of the IPAT procedure is to achieve a higher productivity per m² of solar insolation by repeatedly using the condensation heat, based on traditional greenhouse procedures. The moist warm heat which forms over the seawater basins does not generate condensation on the transparent covers (double glazing) but is cooled with seawater via a heat exchanger. The heated seawater is then stored.

The heat store has the task of absorbing the incoming solar energy during the daytime and returning it to the condensation basin as warm seawater during the night. Warm moist air again forms over the basin and condensation can form a second time.

At the Porto Santo location the local mean solar insolation allowed an average productivity of 1.8 liters/m²/day. The mean productivity of the Porto Santo greenhouse plant over a one year period was 2.0 liters/m²/day. The IPAT plant was able to achieve 15–20% higher productivity after several modifications were made.

Since the completion of the research work in 1985, all basins have been operated along the greenhouse procedure. The plant has continuously supplied drinking water and operational water to an office and workshop building of the LREC institute. The building does not have any other source of water and no supply bottlenecks whatsoever have occurred.

Since it began operations, the plant has been maintained by a member of the institute who does not have any technical background.

The materials used have withstood all weather conditions. This applies both to the aluminium and the glass fibre reinforced plastic profile of the various roof constructions. Sun, wind and sea air have only attacked the paint in places. Of the materials used to line the basins, the styropor matt in one basin is becoming very worn. The operator also complains that the basins are difficult to access for the yearly cleaning. Segmented covers would facilitate this process.

In addition to this desalination plant the research institute LREC has also developed a solar-roof distillator as a joint German-Portuguese project.

Having the form of a solar collector, it is able to satisfy the drinking water needs of one person. Tests and laboratory analyses have shown that this water can hold its own against bottled mineral water.

Work on solar seawater desalination on the Atlantic island of Porto Santo has shown that the greenhouse constructions only require low maintenance and servicing inputs. A 10–year lifetime is quite feasible, even when the plant is operated by non–skilled personnel.

Solar desalination technology is receding worldwide, because other desalination procedures are now available even for small plants which require lower investments, for example the reverse osmosis procedure. However calculations for these systems do not give full weight to the follow–on maintenance costs involved. It is also presumed that oil prices will remain at their low level in future. Should oil prices rise, opportunities for solar desalination will also improve.

Literature:

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– Solare Meerwasser–Entsalzung, V. Janisch, H. Drechsel, Veröffentlichung des Deutschen Zentrums für Entwicklungstechnologien GATE, Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH, Vieweg Verlag, 1984

Volker Janisch

The equipment management cycle: A new tool for planning health care technical services

Stuttgart –Many health institutions and funding agencies have now acknowledged the importance of appropriate and well functioning equipment in health care. In order to reach this goal, however, a lot of obstacles still have to be removed. During the lifespan of each piece of equipment there are several crucial points where problems may occur which were not considered when the equipment was acquired.

Each common piece of equipment passes through a similar sequence of phases from the first moment it is considered necessary, through release of funds, ordering, shipping, training, use, maintenance and repair until it is finally sold or disposed of.

To visualize the life of medical equipment, FAKT, the Association for Appropriate Technologies, has drawn the Equipment Management Cycle, which is presented in the figure. The provision of technical installations to a health institution is seen as a chain or cycle of activities, each of which is of great importance. A breakdown in any link of the equipment cycle will result in problems with all activities in the subsequent links of the chain. All planning and actions undertaken earlier will also be affected. For effective management of resources like equipment, personnel and money, it is essential that these links or steps are known to all parties involved and are executed with care and competence. Any decision on acquiring technical equipment should be based on consideration of the relevant steps of the Equipment Management Cycle. However, it is possible to reorganize a project from every problematic step of the cycle.

Policy formulation is a key issue of the chain. Ideally the district health team or the local hospital administration should start the planning of technical health services with the formulation of a policy that is in accordance with regional health needs.

Equipment Management Cycle

FAKT

Training of users and technicians, too, is not only an important step by itself, but one of the central activities that should be performed at every step of the Equipment Management Cycle. In order to symbolize their importance, they are put in the center of the figure. All parties involved need to be aware of the importance of all steps of equipment management and should know which is their particular part within the picture.

They should all receive training that increases their competence for decision making. Each step should be regularly monitored and evaluated. In meetings, medical, technical and management personnel can discuss the results of their efforts and thus enhance interdisciplinary cooperation.

Information related to the Equipment Management Cycle can be requested from the FAKT question-and-answer service. To facilitate the flow of current information, FAKT has started to develop a computer-based Equipment Management Information System, which is used as a tool to provide information for everybody working with the equipment management cycle. The current version contains information on equipment, suppliers, addresses and training media, to mention only a few examples. More details about spares, accessories and trade names will soon be entered into the computer or card index.

More detailed documentation can be obtained from:

FAKT

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Regional information service centre for South-East Asia on appropriate technology

Chiang Mai –ISAT, the Information Service on Appropriate Technology of GATE/GTZ has contributed to the development of resource information service centres for appropriate technology in a number of countries. The co-operation has mainly targeted non-governmental organisations (NGOs) and concentrated on building up

structures for information and additional capacities for knowledge transfer.

ISAT, GATE/GTZ's Information Service on Appropriate Technology has contributed to the development of information service centres and regional cooperation. The latest regional centre is RISE-AT in Chiang Mai, Thailand.

In recent years ISAT has re-adjusted its approach from promoting local partnership towards regional co-operation. So far, this has resulted in setting up regional know-how transfer centres in East and West Africa, namely the "Regional Appropriate Technology Information Service", RATIS, and "Service Inter-Africain sur les Technologies Appropriées", SIATA, respectively.

The latest regional centre is the Regional Information Service Centre on Appropriate Technology (RISE-AT) in Indochina. The headquarter of RISE is Chiang Mai University, Thailand.

The concept of RISE-AT can be defined as follows: RISE-AT will be functioning as the main co-ordinating agency on a regional level for the purpose of safeguarding the sharing of information on selected technologies through regional network structures. In close co-operation with so-called "key" partners in Thailand, Laos, Vietnam, Cambodia and South-China RISE-AT will primarily ensure the generation, preparation and dissemination of information on selected technologies.

For the initial period from April 95 –October 96 RISE-AT will make available information on selected appropriate technologies –for different users groups in a comprehensive format; it will initiate and ensure coordination among identified information sources at national and regional level and it intends to develop and apply effective means for the dissemination of information.

At present, the service centre will concentrate on solar energy applications, anaerobic fermentation and biogas utilisation, and sustainable agriculture, as well as low-cost housing and energy-saving construction techniques. Know-how and practical experience, derived from project implementation, is institutionalised and available on these subjects from the key partners of RISE-AT.

The main activities for the first phase of the project are related to the provision of information including documents, resources, and advisory services on appropriate technology. The preparation and organisation of seminars and workshops on selected subjects such as the utilisation of solar and biogas technology is being considered as another major activity.

The fact that the initiative for this project came from the Institute of Science and Technology, Research and Development (IST) of the University of Chiang Mai is linked to the current state of economic development in South-East Asia. Economic and technological development has progressed in the countries taking part in RISE-AT at an uneven pace, to differing levels of complexity. Thailand, with its fast economical development, is now in the position to provide technical assistance to neighbouring countries. Technical solutions in many fields are already available in Thailand and, because of similar cultural and environmental conditions within the Indo-Chinese region, these can easily be transferred and applied in other areas of the region.

IST, a national research institution, has accumulated a profound basis of knowledge in various technological fields including solar energy, biomass utilisation, rational use of energy and anaerobic waste water treatment. It already offers services on the basis of applied research and development, conducted on campus and elsewhere, designed for promotion and commercialisation in Thailand and increasingly bordering countries.

In a first step towards formulating a concept for RISE-AT, an orientation phase was carried out aimed at the assessment of relevant problems and needs regarding information demand and supply as well as at potential

institutions regarding their willingness to cooperate. The study was conducted in the targeted countries. Beside governmental and non-governmental organisations, donor agencies and the private sector were also approached.

Summarised, the study came to the following conclusions:

- General information is often available, however, rarely directly applicable for intermediaries and end-users;
- Institutional facilities to manage available knowledge and experience are lacking;
- Existing information services mainly concentrate on literature searching;
- Specific "Question
- Information services are not based on a network structure and exchange mechanisms;
- A large number of institutions on national and regional level are interested and willing to join a network structure;
- Although technological levels differ widely between selected countries, their application among the target group of the rural and urban poor show similar conditions;
- Technology is generally promoted by a limited number of sector-oriented organisations; interdisciplinary exchange of information is often missing.

Beside renewable energy (solar and biomass) and anaerobic digestion and biogas utilisation, sustainable agriculture and low-cost housing and energy-saving construction techniques are areas where information is in great demand.

For more information please contact:

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South–South dialogue: SIATA workshop in the GTZ

Eschborn –The third workshop of the official delegates of the South association SIATA was held at the GTZ in Eschborn, Germany in July 1995. SIATA Service Inter–Africain sur les Technologies Appropriées is supported by GATE and was established in Ouagadougou/Burkina Faso in December 1993. It has since become a contact and consultancy centre for African NGOs involved or interested in appropriate technologies and assistance to small projects.

SIATA is not just a documentation centre it considers its chief mission to be the professional networking of the c. 30 NGOs presently involved in the service, and to provide financial support to further an exchange of knowledge and experience. The two–week workshop at the GTZ also reviewed applications from NGOs for SIATA assistance for small–scale projects. Five of the 22 applications filed were rated as eligible for assistance.

Participants at the SIATA–GTZ–Workshop in July in Eschborn.

Photo: ISAT

The committee deciding on financial assistance consists of six NGO representatives from Senegal, Mali, Cameroon, Zaire and Burkina Faso and one member of GATE staff. Marie Savadogo, a former diplomat and lawyer who is now SIATA coordinator regrets the difficulties encountered in accessing members for coordination purposes. "But this a permanent feature of inner–African cooperation and has to be accepted." SIATAs journal ("Le Grenier") is therefore a vital communication vehicle. It is published twice yearly with a circulation of 1000 to 2000 copies. GATE financing for the journal is only assured until mid 1996, as is the financial support for SIATA itself. GATEs Rudolf Kiessling comments: "We are looking for sponsors to take on the financing provided to date from the BMZ budget." In the medium term, SIATA will not be able to finance its own operations by charging higher consultancy fees. The aim is to publicize SIATAs activities and the organization itself, so that in future it can earn income to cover part of its operating costs. Rudolf Kiesslings tip: "Next time you fly Air Afrique, spend your time reading Le Grenier instead of Le Monde its far more appropriate reading for travellers to Africa."

Development scene

- * Bonn to be North–South Centre
- * GTZ: fall in commissions
- * Development policy as "global structural policy"

Bonn to be North–South Centre

Bonn –Plans are afoot to make the city of Bonn a "Centre for Development Policy". National and

international institutions concerned with development policy, research institutions, church-based institutions, non-governmental organisations, foundations and other associations will base themselves in Bonn, the schemes backers hope. The idea of such a "North-South Centre" arose soon after the German parliament decided in 1991 to move the capital of Germany from Bonn to Berlin. At the time it was decided that the Ministry for Economic Co-operation and Development (BMZ) should keep its base in Bonn. In the meantime several steps were taken to implement the plan.

The first successful attempt to relocate UN institutions to Bonn was the decision in January 1995 to move the United Nations Volunteers programme from Geneva to Bonn. The UNV has about 330 employees and will probably settle in Bonn in July 1996. The decision about the date when the German Development Service (DED), the German Foundation for International Development (DSE) and the German Institute for Development Policy (DIE) will move from Berlin to Bonn is to be taken in the autumn. In May agreement was reached to establish a "Centre for Development Research", Zentrum für Entwicklungsforschung (ZEF) in Bonn university; it will start work in summer 1996.

The ZEF will have three departments: political and cultural change; economic and technological change; and potential use of the natural environment, ecology and resource management. Uwe Holtz, the long-standing chairman of the parliamentary committee for economic co-operation and development is a founding member of the centre and remains actively involved.

GTZ: fall in commissions

El Salvador: Ex guerrilleros being trained for farming work. Part of GTZ efforts to reintegrate more than 40,500 former government soldiers and guerrilleros.

Photo: GTZ

Eschborn – After many years of expansion the German Agency for Technical Cooperation (GTZ) last year saw a 9.8% fall in commissions. The total operating performance stagnated at a level of 1.587 billion DM. As the general manager of the GTZ explained when presenting the 1994 annual report, this means "in many cases real cuts in development contributions". State Secretary Wighard Hårdt, chairman of the Supervisory board of the GTZ, referred in his presentation of the report to a recent comprehensive impact analysis of the company. The GTZ is responsible for technical cooperation by the German government in Africa, Asia, Latin America, Eastern Europe, the countries of the Caucasus and the Middle East. "The results of this study of 130 completed development initiatives show that the vast majority of the projects were successful", said the State Secretary. However, the study also showed that the political framework, the structures and management capacities on the part of partner organisations should be analysed more carefully in the future.

There has been an increase in the work of the GTZ in the area of refugee and emergency relief help. In Africa, this area has become the third focal point besides the establishment of democratic institutions and the emphasis on social aspects in the economic development process, the annual report stated. The general manager of the GTZ announced a stronger move towards decentralisation in coming years. The company, which is located in Eschborn near Frankfurt, sees its "central business task as locating decision-making powers at the relevant level inside and outside Germany".

In 1994 the GTZ employed in its head office 1,352 people. Abroad, it has 1,539 employees and 5,461 personnel under local project contracts.

Development policy as "global structural policy"

Bonn –The annual assessment by EUROSTEP of development co-operation, published in Germany by Deutsche Welthungerhilfe and terre des hommes, supports the efforts of the Ministry for Economic Co-operation and Development (BMZ) to gain more power. Carl-Dieter Spranger, BMZ Minister said he "was very pleased to hear that the NGOs support our main views, such as the necessary concentration of developmental tasks in the BMZ and the effort to ensure that development co-operation is understood as an essential task for ensuring a global future as well as the future of Germany", in comments on the German report of the organisation of European NGOs.

The report recommends a "global structural policy" as a model for development policy.

To bring this term to life the task is to redefine the form and content of action by the State and to find new structures and instruments at the institutional level, the report argues. Greater powers, financial resources and more ministry staff are necessary. However the ministry's budget for next year is set for a below-average increase of only 1.7%.

Bookbox

- * New HEP Publications
- * Disaster Relief
- * Participation
- * Fish as Biocontrol Agents in Rice
- * Bioindicator for the Effect of Pesticides

New HEP Publications

Blockbusters or shelfwarmers? HEP SR. No. 3. French edition: Succes commercial ou invendus? Approches pour la diffusion rÃ©ussie de technologies domestiques.

This brochure is about "dissemination strategies for improved household energy technologies". It is directed at decision-makers and planners, but also at workers in projects, enabling them to plan and implement successfully household energy projects. "Successfully" means sustainable, needs-oriented and related to the different target groups of such initiatives. The basis of the work are experiences from a number of country programmes and project components in the area of household energy, which are supported by GTZ and carried out in Burkina Faso, Mali, Niger, Kenya, Tanzania, Pakistan, Madagascar, Tunisia etc..

Improved Community Cookstoves. An appropriate technology for public and private institutions. French

edition: Fourneaux améliorées des cuisines de collectives. Une technologie appropriée pour les cuisines collectives privées et publiques.

This book deals with energy-saving technologies for large-scale kitchens, such as in hospitals, orphanages, schools, army barracks and prisons. Technical details and instructions about the cookstoves are mentioned, along with problems with the infrastructure regarding dissemination maintenance, and aspects related to profitability and health.

Examples include the reduction of respiratory infections by reducing the exposure to smoke gas and reduced dangers of accidents when using these energy-saving technologies. This is shown through the example of the large-scale kitchen project in SEP (GTZ/CAMARTEC) Tanzania.

Orders from:

Deutsche Gesellschaft für technische Zusammenarbeit (GTZ)

Division 423.4 Agricultural Farm and Household Systems

Household Energy Programme

P.O: Box 5180

D-65726 Eschborn

Fax: +49 61967 97325

Disaster Relief

AT-Forum No. 6, 1995. Newsletter of German AT Association, the artefact Centre for Appropriate Technology and the Artes Institut.

Free of charge.

ISSN 0943-9757.

artefact

Bremsbergallee 35

D-24960 Glücksburg

Germany

The new issue of this magazine on Appropriate Technology (AT) has the focus "disaster relief".

Some of the questions, discussed in this issue of AT Forum are: How can local selfhelp potential in disaster situations best be mobilised? What role do local institutions have to play in this? How can the experience from disaster aid deployments be effectively evaluated? How can war veterans and refugees be reintegrated into society and economic life? Other articles are about: Rural electrification in China and desertification.

Participation

Michael SchÄ¶nhuth and Uwe Kievelitz: Participatory Learning Approaches. Rapid Rural Appraisal. Participatory Appraisal. An introductory guide.

GTZ, Eschborn, Germany, 1994. 183 pp.

ISBN: 3–9801067–5–6

Schriftenreihe der GTZ 248

GTZ

P.O. Box 5180

62726 Eschborn

Germany

This sourcebook reviews approaches and methods of participation and includes conflict resolution, quality assurance, institutional reforms, scaling up, and the ethics of relations with villagers. The source of information and contacts listed will also enable readers to follow up and find out more in this rapidly evolving field.

Fish as Biocontrol Agents in Rice

Matthias Halwart: Fish as Biocontrol Agents in Rice. The potential of common *Cyprinus carpio* (L.) and Nile tilapia *Oreochromis niloticus* (L.)

Weikersheim (Germany) 1994. 169 pp, ill.

ISBN: 3–8236–1241–7

Tropical Agroecology

Margraf Verlag

P.O.Box 105

Weikersheim

Germany

Worldwide there is an increasing need for sustainable crop production making efficient use of scarce natural resources.

The integration of fish culture in rice-based farming systems has a long tradition in parts of Asia and, after a period of heavy pesticide use, rice-fish culture is currently regaining importance in the region.

The economic viability of this integrated enterprise has been documented in many studies, however agro-ecological impacts have received little attention.

This book deals with the contribution of two common and widespread fish species to integrated pest management (IPM), particularly the biological control of pests, in rice.

Bioindicator for the Effect of Pesticides

Andreas Drews: Bioindicator for the Effect of Pesticides on the Agricultural Environment. A Manual.

Sana'a, Yemen, 1994. 38 pp.

Yemeni-German Plant Protection Project

P.O. Box 26

Sana'a

Republic of Yemen

This manual is the product of three consulting visits of the author in Yemen during 1992 and 1993. The objectives were to identify a bioindicator for monitoring pesticide impact on the agroecosystem of the central highlands of Yemen. As a result of the experiments and the survey conducted the bug fauna in alfalfa fields was identified as a suitable bioindicator.

News in brief

* ITC-4: Opportunities for NGOs to get involved

* Eco-exports

* Urban Solid Waste Series

ITC-4: Opportunities for NGOs to get involved

What? The FAO has established an office to lead the process towards the Fourth International Technical

GATE – 3/95 – Sustainability in smallholder agriculture

Conference (ITC–4) on Plant Genetic Resources (PGR), to be held in June 1996 in Germany. This should result in the adoption of a State of the World Report on PGR, and a Global Plan of Action. The outcome of the ITC and its plan of action are expected to set the PGR agenda for many years to come. The process has been conceived in a country–driven approach, and wide social and institutional participation is possible and has been requested at national, regional and international levels.

Who? NGOs concerned with the on–farm genetic resources management agenda, and farming and indigenous communities have an unique opportunity to influence the ITC–4 results and push for integrated farming approaches and the rights of local people.

Why? If NGOs do not get involved, the whole process could be dominated by governments, official agricultural institutions and private interests, and lead to an exclusive focus on ex situ genebank approaches to agricultural genetic resources management.

When? Right now countries are working on their national PGR reports: nearly 50 have already submitted drafts to FAO, and another 70 are working on them. Eleven sub–regional meetings will be held, between July and the end of this year, to help build consensus before the ITC–4.

Where? NGO involvement should go all the way from inputting into the national reports and plans of action, attending the sub–regional meetings, and lobbying the governments at the ITC–4 itself.

How? Use the following addresses to find out who your national contact point is and get involved. Try to get NGO representation at the sub–regional meetings: in some cases it might be possible to be part of the official government delegation. Get access to a special electronic bulletin board the FAO has put up. Ask BUKO, a German NGO, to put you on the mailing list for future ITC–4 briefings.

ICPPGR

Secretariat/FAO

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Nernstweg 32–34

D–22765, Hamburg

Germany

Phone: (49–40) 39.25.26

Fax: (49–40) 390.75.20

Source: GRAIN Biobriefing No. 5, May 1995

Eco-exports

During an international agricultural conference on "Eco-exports demand and profitability for small farmers and cooperatives" at the end of 1994 at Finkhof in Germany, the participants drew up the following demands:

- A comparison of costs should be made between traditional products and organic products which also incorporates costs for advisory services, training and certification; the findings should be passed on to buyers of organic products.
- A North-to-South exchange of information should be organised, covering demand, prices, production conditions, etc.
- Certification institutions of countries in the Northern hemisphere should train local experts in countries in the Southern hemisphere to carry out this certification procedure in their own country.

GATE – 3/95 – Sustainability in smallholder agriculture

- Research projects in countries in the Southern hemisphere should be supported so that these countries can process their raw produce themselves and earn the added value.
- A specific percentage of profits from eco–trading should be used to promote development in producer regions.

Proceedings of the conference available from:

Finkhof

Ulrich Str. 1

D–88410 Arnach

Germany

Urban Solid Waste Series

This article is based on the results of a research project which studied existing solid waste recycling options within small–scale enterprises that generate employment and try to solve the growing waste problems in developing countries.

The research carried out in Manila (the Philippines), Calcutta (India), Cairo (Egypt), Accra (Ghana), Bamako (Mali) and Nairobi (Kenya) by CAPS, Ptr Services, EQI, AB& GERAD and USK respectively investigated the recycling of ten waste materials: rubber, plastics, motor oil, cooking oil, tin cans, photochemicals, broken glass, bone and horn, household batteries and organic waste.

Results are disseminated in the so–called Urban Solid Waste Series. More information about plastic waste can be found in Plastic Waste: Options for Small–Scale Resource Recovery (ISBN 90–70857–34–0. Price: \$13), which is the second title in this series.

The book describes how plastic waste is reprocessed in informal small–scale enterprises and turned into final or semi–manufactured products ready for use by formal industries.

The publication can be ordered online from Backhuys Publishers.

or from:

TOOL Books

Warmonderweg 80

2341 KZ Oegstgeest

the Netherlands

Fax: +31 71 51717856

WWW: <http://www.tool.nl/>

Letters to the editor

Plant-based sewage treatment

We welcome letters from our readers. In this issue we are launching the section Letters to the Editor. Unfortunately it may be necessary to shorten letters.

In the following letter the author reacts critically to a photograph of a plant-based sewage treatment facility in Córdoba, Argentina which was published in gate 1/95, p. 20. This sort of sewage treatment is becoming popular in industrialised countries, but here also it is not without its critics. Henning Schiller, the GTZ staff member who was in charge of the plants planning responds to the criticisms of the Argentinian pilot plant.

Dear editor

I have received your prestigious journal gate for several years and truly enjoyed learning about the state of the art in appropriate technology and about your efforts to exchange this information with third world countries.

In December 1991 issue (4/91) pp 24–30, you published an article authored by Henning Schiller, entitled "Sewage treatment with soil-and-plant filters Report from Sierra de Córdoba, Argentina". Later a short note recommending this plant as an option for wastewater treatment in developing countries appeared in gate January–March, 1/95.

The photograph in this note belongs to a plant serving a holiday resort of the Villa Maria Electrical Trade-Union, in the town of Cosquín, Province of Córdoba, Argentina. I have serious objections about this plant and believe that your recommendation could be misleading for those who might be interested in this system without further studies on reliability and proper application of this kind of plant.

It happens that I own a villa where we spend weekends and holidays, just a few blocks down from the point the plant discharges its effluents in the Cosquín river. From my first hand personal experience I should catalog this plant as a failure and support my judgement with several facts that can be easily verified.

a) This plant produces high levels of unbearable of fetid emanations, which has forced the installation of an outlet to vent the gases. In the picture published in gate the vent system has been purposely left out. This situation has deteriorated recently and it was necessary to raise and reinforce the vent system. Although it was camouflaged with green paint it did not solve the main problem, the stinking odors.

b) Since this wastewater plant was activated, we have noticed in the river stream an explosive proliferation of water-blooms, which clogged the river-bed and ruined one of the nicest spots of Córdoba. In addition to the

release of phosphates and nitrates responsible for the growth of algae, one has the suspicion that other compounds are not completely cleared by the plant roots and are discharged in the river, making it unsafe and hazardous for swimmers and bathers, who crowd the beaches in summer.

c) The high pressures that build up inside the basin from the roots, water and gases have already produced cracks and leakages in the exposed walls, and this situation will certainly worsen in the near future. Also, without any reasonable doubt we can guess that similar cracks should be taking place in the floors and unexposed walls.

d) As discussed in the article: "Using of root-zone wastewater treatment plants" in the same gate issue, an efficient sludge treatment stage is necessary. In the plant we question whether the required minimum of 5 m² per inhabitant for the root-zone sewage treatment facility was met or not because it was not foreseen the development of the resort, where the number of cottages constructed has increased five-fold since this plant was put in action.

Prof. Dr. Augstin Aoki, Director

The facility described by Mr. Aoki was completed at the beginning of 1990. It is the most elaborate of its sort in CÃ3rdoba including terraces, four different levels of basins and different hydraulic gradients. There was no other land available and the holiday camp could only offer this place as a possible location.

a) Smell: Treating sewage obviously creates a certain level of smell. Our latest visit took place in June (1995) and did not reveal an outstanding level of smell. Indeed, in all constructions of this type there are natural problems with smell during the limited periods of dryness (about four weeks per year) within the initial three years (January to February is the schedule), since the filter is then dried and there is no clearing of the sewage water during that time. This does not, however, apply to the normal functioning of the plant.

In the past we had several problems with the regulation of the draining chamber. Therefore, we offered advice and showed the plant operators how to use the hydraulic control mechanism.

The operators were asked not to interfere with the plant any more and since then we have had no further complaints about the smell. The responsible official at the holiday camp will also take part in further training courses.

The holiday camp has expanded considerably over the last four years. A hydraulic overburdening of the plant due to the quantity of sewage during the high season is not out of the question. This is also part of our research.

This does not count against the technology used, rather the opposite: When the hydraulic burden increases, one expects a higher demand for land. The research carried out by our organisation and the local authority concerned indicates stable reduction performance.

Since the sewage treatment plan and the holiday camp are direct neighbours (access to flats and the inflow are only about 20 meters apart) we repeatedly asked holiday-makers (in the directly neighbouring pavilion) whether they had noticed a smell which harms their well-being.

We always had negative responses. It is amazing that Mr. Aoki, who built his villa about 80 meters from the inflow, can smell something today.

The holiday camp installed ventilation pipes into the draining chambers without our knowledge and while I was absent instead of proper controlling the hydraulic regulation capacity of the drainage.

This invention is admittedly an act of monumental dimwittedness but is not related to the normal functioning of the plant and was neither planned nor designed. However, the damage is only to the eye.

b) In a region where there are several dozen holiday camps and where parts of Cosquin have insufficient or no sewage clearing facilities, causing sewage to flow into the river, is the only functioning sewage treatment plant really responsible for the severe environmental pollution?

c) An important point is raised here: We have also found cracks in the basins in other pilot plants. We wanted to integrate local know-how as much as we could.

Since bricklaying with cement-rendered bricks and steel-concrete allegedly is one of the standard construction methods with which basins and several thousand of swimming pools were built, we assumed no problems in that area. Unfortunately this was a wrong assumption. Therefore, we decided to build the new pilot plants exclusively in with a foil-sealing technique.

d) Here Professor Aoki raises the topic of the lack of foresight regarding the future development of the holiday camp. This problem applies to the whole of Argentina where there is a lack of urban and regional planning. However, there are no technical factors preventing an extension of the plant.

Henning Schiller

If you also want to send a letter to the editor, please refer to our postal or e-mail address under: Contact and Communication.

Next issue gate 4/95

This issue will have a regional focus. The working title is:

The work of NGOs in Latin America.

Reports on experience from numerous NGOs will provide an insight into such subjects as how their work is influenced by ethnic conflicts, decentralization and the drug problem.

Publications

Information: Online ...

ISAT uses the latest communications technology. The project is linked to various electronic data networks. ISAT can still be contacted by E-mail via APC ComLink-Net, but now you can reach us directly at gtz under gate-isat@gtz.de. ISAT also has access to the Dutch TOOLNET. From January 1996 on we are providing information online through the World Wide Web. We will try to build up a full-featured, public accessible Internet Information Service in order to give users throughout the world, the developing world in particular, fast and easy access to a growing information base on appropriate technology and the activities of ISAT.

... and "classical"

With its English-language quarterly magazine gate –questions, answers, information, ISAT has regularly been providing a wide audience with information since 1982. Reports by experts and specialized journalists, some of them from the South, provide information on topics of current interest from the field of socially and environmentally acceptable technologies. Equal attention is given to field reports. gate has a world-wide readership of 25,000.

The series Aus der Arbeit von GATE (GATE Reports), which has been published for more than ten years in collaboration with the renowned publishers Friedrich Vieweg & Sohn, now includes more than 80 specialized publications on the most varied topics. Most of the publications go to interested parties in the Third World.

To obtain the GATE/ISAT publications please order the publication list. The complete list of our publications together with an online-"click & order" facility will be available on the net soon. You will find a link on this web page! You can already subscribe to the gate magazine online.

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GATE – 3/95 – Sustainability in smallholder agriculture

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