ENCYCLOPEDIA OF SUSTAINABILITY
news
BOTH ENDS
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We are what we eat

It seems as if agriculture is under siege from agrochemical multinational companies, at the expense of biological and cultural diversity and social equity. The proponents of gene technology claim that agrobiotechnology will ensure enough and better food for the world's increasing population. Is it as simple as that, easy to swallow, or easy to dismiss?

Gene technology modifies the genetic structure (known as DNA) of an organism, to change or add a desired trait or characteristic, far more drastically than the traditional science of plant breeders who have modified plants for thousands of years. Genetic engineering, which can involve splicing a gene from a totally alien species into another, such as from a shrimp into a tomato, can also include exotic genes which are used as promoters, markers or vectors. The goal is to increase yields by making them resistant to herbicides or insecticides or building tolerance for climatic variations.



photo: Centro Ecológico, Brazil

Current concern is not only about the possible implications for human health, or biodiversity, but also about the concentration of research and trade in seeds, whilst recognising that most seeds in the world are not traded commercially.

Where there are alternatives

If gene technology indeed overcomes current scepticism and delivers a safe promise for a sound future, we shall need strong precautionary principles in relation to health and environment. Equally, we must address the risks of the economic and technological dependency that it creates for farmers, consumers, researchers and governments.

The Encyclopedia of Sustainability highlights resistance to gene technology and illustrates alternative community approaches to food security: from a GMO-free zone in Brazil to a widely-replicated set of demands in the United Kingdom for a moratorium on the use of GMOs in food production. There are other challenges to farmers in the South: unfair competition from food surpluses from Northern producers; the high cost of inputs; the disappointments and dependencies resulting from the Green Revolution.

Against this background, it makes sense for farmers to create, or restore, viable alternatives. In fact, many low-input agricultural practices foster biological diversity and address the livelihood needs of practitioners. In Bolivia, bioregulators are replacing expensive agrochemicals. In Zambia, farmers are returning to the drought-resistant seeds they abandoned in favour of high yielding ones, whilst in Brazil polyculture is gaining ground and in India, the adoption rate of integrated crop management is soaring. All decentralised, in the hands of local producers.

Freedom of choice

By contrast, today's gene technology puts control over food security in the hands of a few central experts and corporations. To use gene technology is to choose for a path of no return. It will alter ecosystems, making it impossible to guarantee organic or gene tech-free products.

The Encyclopedia shows us a range of agricultural systems, local varieties of plants and diets, an increase in production, enhancement of human capacities and ... freedom of choice for generations to come.

Editorial

Welcome to the second newsletter of the Encyclopedia of Sustainability. This collection of environmental, people-oriented initiatives continues to grow, describing how communities worldwide are innovating for sustainability. So far, almost 50 initiatives of local NGOs and grassroots organisations from all over the world have been analysed, documented, strengthened and shared with others.

Both ENDS launched this project in 1998 to draw attention to many locally rooted environmental initiatives. It aims to inspire other organisations and policy makers, with concrete examples that help visualise what "sustainable development" means in practice. Most initiatives so far have focused on the issues of Ecological Restoration and Integrated River Basin Management highlighted in the first Newsletter. Other initiatives are related to Gene Technology in Food and Agriculture, Land Rights and Non-timber Forest Products.

This second Newsletter focuses on initiatives around gene technology and other issues relating to sound agriculture and sound food - all enjoy widespread interest at present. As well as the introduction of genetically modified organisms (GMOs), we look at alternative practices in crop protection and seed selection.

The newsletter is being widely distributed to partners in local initiatives and at key international fora, such as the COP-6 to the Convention on Biological Diversity in April 2002, during discussions on GMOs in The Netherlands and elsewhere, and to other interested bodies. You are welcome to share its information with others, it belongs to us all.

In this issue

2 Agenda for restoration: The Do-able Dozen
case: Heading towards freedom (Brazil)
case: All-round agriculture wins on poor soils (Brazil)

3 Dutch juggle hot potatoes
case: A question of method (India)
case: The future is a reflection of the past (Zambia)

4 Complete on the Web Encyclopedia of Sustainability Useful Websites
case: Promoting pest control, naturally (Bolivia)
case: Broad Alliance (UK)

Encyclopedia of Sustainability

How people make the difference

We are not a moment too soon. Today's environmental problems are growing hand-in-hand with the erosion of traditional systems of natural resource management; the situation is being aggravated by social and political conflicts. We need, in short, fresh perspectives for alternative solutions. And so, the 'Encyclopedia of Sustainability' was launched by Both ENDS and its partners in 1998, to strengthen concrete initiatives by presenting different 'images' of sustainable water and land use strategies which could inspire NGOs, policy makers and the public.

The ones that work

Since its beginnings, the Encyclopedia has highlighted strategic initiatives which show how local communities, governments and private sector can restore soils, water tables and agricultural and biological diversity. Now the 'Coral Reef Restoration' practices around Apo Island in the Philippines, and 'Analog Forestry' and certified Forest Garden Products developed in Sri Lanka, are being adopted in other countries. The Non-Timber Forest Products (NTFPs) Exchange Programme is enhancing local capacity building through the direct exchange of expertise, between indigenous peoples, NGOs, traders and local consultants. And the Encyclopedia has helped establish a regional NTFP desk in the Philippines and to organise a NTFP Trade Fair in Russia-Siberia.

In water management, the Encyclopedia has enabled world-wide NGO coalitions to present their approaches of river basin management at international fora like the second World Water Forum in 2000. Both ENDS and IUCN are working to weave such initiatives into the preparations of the third World Water Forum, due to be held in Japan in 2003. To highlight local experiences even more, Both ENDS and Gomukh (India) have launched the 'River Basin Development: A Negotiated Approach' project.

Local goes global

The Encyclopedia has also highlighted effective tools and strategies for securing land rights. From northern Canada and the Guyanas there is map-making by local people using 'geomatics', a combination of digital information, navigation, imaging and satellite technologies, with a user's reference manual in preparation. From Colombia, the case of certified 'Green Gold' shines bright, extracting gold without the use of mercury or cyanide and restoring degraded grounds. The sale of green gold helps local communities to consolidate their land rights and to explore alternative uses of their land. Other gold mining communities, from Tanzania to Brazil, are keen to learn from the Colombian experience which has also impressed market traders and donors in Europe.

A recurrent feature of these initiatives is the rehabilitation and strengthening of social institutions, ensuring sound management and equitable distribution of natural resources. A key starting point has been the consideration of local priorities and circumstances, and skills and materials; the marriage of modern and traditional wisdom have often been part of these ventures. Both ENDS will continue to identify new initiatives and focus on the exchange of such experiences, with proper regard for economic aspects and gender dynamics.

Your suggestions for new initiatives to include in the Encylopedia are always welcome.

ENCYCLOPEDIA C

Transgenics ban in Brazilian state

Heading towards freedom

Agenda for restoration

1. Biological diversity is the essential key for the development and survival of the human species. Local peoples' control over biological resources must be paramount.

2. Solutions to pests and plagues can be often found in local ecosystems, especially with rich agro-biodiversity. We must promote exchanges of knowledge and technology and ensure that local communities, as custodians of such ecosystems, profit from them.

3. Where traditional land and water management systems are no longer adequate, improvements and investments are required with the full participation of local people, and including gender-sensitive research.

4. We must direct research and investment in methods which promote secure livelihoods and environmental integrity. Organic agriculture must be a priority.

5. We need a comparative analysis of the economic rates of return on investment in gene technology and in organic agriculture.

6. Governments should protect the ecological basis of food production, safeguard farmers rights, and citizens' rights to a safe and healthy environment and food supply. Technologies that threaten this should not be left to free market mechanisms.

7. People must have equal access to information. We need independent assessments of the effects of gene technology on health, ecosystem, ethics, and welfare.

8. Applying gene technology in agriculture is essentially different from conventional technologies. Its impact knows no boundaries: the real risk of cross-pollination makes it impossible for GM and GM-free crops to co-exist.

9. Governments must implement mechanisms by which companies assume full responsibility and provide compensation for economic, ecological and social damage, particularly irreversible damage, both short- and long-term, resulting from gene technology.

10. More countries should ratify the Convention on Biodiversity and the Biosafety Protocol. This enshrines the precautionary principle relating to transboundary movements of GM produce.

11. All countries should ratify the Treaty on Plant Genetic Resources for Food and Agriculture, approved at FAO in 2001. It establishes farmers' rights and protects many seeds of staple foods, crops and basic forages from any claim on intellectual property

12. Governments should reject the WTO "TRIPS" agreements on Trade-Related Aspects of Intellectual Property Rights. These will create dependency relations undermining the well-being of communities.



photo: César Volpato, Brazil

Guarani Maize from Rio Grande do Sul, Brazil

Rio Grande do Sul is the southernmost state of Brazil, bordering Argentina and Uruguay. It is an important agricultural area producing grain (mainly soy), fruits and vegetables. Brazil produces 18% of the world's soy, making it the world's second biggest soy producer - with the bulk of the crop being non-modified. In 1999, the state government proposed a moratorium on genetically modified organisms (GMOs). That same year, it issued a decree enforcing an environmental impact analysis before any GMOs could be released into the environment. The state government intended to declare the region as a "transgenic free zone" and ban all GMOs from agricultural produce, a dramatic enough move given its place as a world-scale producer.

In the early 1999, the government of the state of Rio Grande do Sul together with several civil society organisations - among them Centro Ecológico, CETAP, and CAPA - began mobilising farmers to support a GMO free state. The three NGOs - each one well-experienced in mobilising different groups - were instrumental in bringing together farmers, local government, labour unions, and other civil society organisations. They had been founded in the 1980s following discussions on the state's law to improve control over the use of agro-chemicals. The three NGOs set out to counter the trend of using chemical inputs by working with small landholding farmers and showing them viable alternatives - and ended up shaping laws.

Unsafe and sorry

Critics of GMOs point out the risks of inadequate knowledge about their impact on human health and environment. Additionally, current GMOs make small and medium farmers in the South dependent on the products and knowledge of a few multinational companies, exacerbating power differences between the North and the South. Proponents of GMOs, multinationals (MNCs) and some governments think otherwise. Already, a handful of MNCs (such as Monsanto, Novartis and AgrEvo), most of whom are active in Brazil, control the world's production and development of GM seeds, the main ones being soybean, maize, potatoes, tomatoes and rice. MNCs, as commercial undertakings, seem unconcerned with the social and ecological repercussions of GMOs and they sing their alleged benefits. We have heard and seen this before. In the 1970s, MNCs praised the benifits of organochlorrades (of which the most notorious is DDT) claiming it was harmless to humans and the environment and that it would solve the problem of crop pesticides, leading to improved crop yields. But that was not the case. And now they praise the benefits of GMOs, relying on their vast financial resources to sway farmers and governments to use them.

It takes years

Brazilian NGOs such as Centro Ecológico, CETAP, and CAPA have been working to combat the actions of MNCs and to make farmers aware of the risks posed by GMOs. This kind of work has been easier to do with small and medium landholding farmers, largely because all three organisations have worked closely with these farmers over several years. Farmers who have developed and implemented small-scale seed conservation techniques and marketed organic produce are now experiencing a sense of control over their environment and livelihood. Eliminating the cost of inputs has improved their socio-economic conditions. They also feel that their work is contributing to maintain the biological diversity of the area.

This initiative clearly shows that it is possible to stand up to MNCs when governments and civil society organisations work together to promote a more informed discussion over an important issue. The state government's willingness to debate GMOs opened possibilities to discuss, delay and eventually ban transgenics from the area. In 1999-2000, more than 12,000 people participated in discussions around the issue and until now over one million people have learned about GMOs from the media. Outside of the state, other NGOs have joined the campaign for a Brazil free of GMOs. Additionally, the government has encouraged the establishment of markets for organic produce. State public schools are buying organic food produced by small holding farmers. Low interest loans are available to develop organic agriculture and processing units (e.g. small scale agroindustries).

However, crucial challenges lie ahead. There are state elections in 2002. The government's decision has not been popular in rural areas where the Brazilian Workers Party is weak. Conflicts have surfaced. To uphold its decision, the state government is changing tactics. Up till now, it has targeted its message to producers. Now, it wishes to take its message of GMOs to consumers. The government has set to work, passing a law that requires labelling of every product that contains any level of GMOs.

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Polyculture in Brazilian drylands

All-round agriculture wins on poor s

Although Brazil is commonly known for its luscious rainforest, it also has large tracts of drylands or Sertão. The state of Bahia is part of this dryland region. The *caatinga*, a dry bush, predominates and rain is erratic, often coming in downpours followed by long dry periods, even in the rainy season. Most local people here are farmers who plant corn and beans for their own consumption and castor as a cash crop.

Bahia is one of the poorest states in Brazil. Dwindling water resources and degraded soils have led to erratic fluctuations in castor crops, leading to a collapse in the local economy and an exodus of residents to urban areas. Resuscitating the local economy has required improving castor production and making it environmentally and economically sustainable to farmers.

In November 1999, with start-up funding from the castor industry, Henrique Souza - an agronomist well-versed in Ernst Götschs' famous agroforest system - designed 15 experimental so-called polyculture fields (often known as multi-purpose) on farmers' plots. In the first year, results were far beyond expectations, doubling castor production. This gave birth to the Polyculture project in Bahia.

Multi-purpose cultivation

Polyculture imitates the ecology of a natural ecosystem, maintaining its resiliency. The key to polyculture is the correct combination of plants, fruit and forage trees with annual crops, and the correct management of the phases. The layout of fields is designed in such a way as to avoid exposing the soil to the sun. This conserves water and over the years it improves soil fertility. Polyculture can be adapted to any climate. It has been successfully adapted for all the major climates of Brazil, which include rainforest, sub-tropical, savanna and drylands.

Currently, the project boasts 47 demonstration fields on farmers' plots and works with 1,000 farmers. Farm yields have increased and there is a general feeling of optimism as incomes and food security have improved. Farmers can sell

Integrated crop management in India

A question of method

The consequences of the Green Revolution promoted by state and regional governments during the 1970s continues to affect farmers. In the southern Indian state of Tamil Nadu, farmers had become overly dependent on state-subsidised inputs. Many had to take loans from local money lenders at exorbitant interest rates to purchase them. Over the years, the results have become quite dramatic: the build-up of inputs has deteriorated agricultural conditions, leading to low yields, and farmers have been left with large debts to pay.

In 1995, the Centre to Actuate the Rural Environment (CARE) set out to reverse this situation. It began its work in the Pudukottal district, in central Tamil Nadu. Here, rice is grown in paddy fields and women work in cultivating, harvesting, and selling groundnut. CARE developed a programme of Integrated Crop Management (ICM) which combines various activities to deal with agricultural and ecological problems. Ploughing methods take into account the season and the weeds that may enter the field; pest control is done biologically as well as by hand; simple techniques are introduced to select the seeds to be sown and to increase the chance of germination; water levels in the fields are regulated to control soil moisture and weed populations; agricultural waste is brought into use as fertiliser and soil nutrients; and intercropping and soil rotation are used to enrich the soil. At the same time, CARE also set out to improve the role of women in the community. They promoted the organisation of women's self-help groups and their participation in agricultural practices.

Not marginal any more

Through the implementation of the Integrated Care Program, CARE has helped farmers to advance their socio-economic condition. Small kitchen gardens have improved the household diet and the expense of purchasing agricultural inputs has been removed. CARE also runs a Farmer's Field School where farmers are trained in various aspects of crop and pest management. At the heart of its approach is a commitment to facilitate the exchange of information between other farmers and other civil society organisations so that farmers feel less marginalised and able to work collectively to improve their circumstances.

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photo: Care, India

Farmers using a cycle tyre to calculate crop density

ils

their castor to two large scale factories and four smaller ones. Although the project started with the castor crop, it has now proven perfectly applicable in other regions that rely on other cash crops. There are plans to take the polyculture model into local agricultural schools and to develop a manual to make the system more accessible to others.

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Dutch juggle hot potatoes

In mid-2001, the Dutch government appointed a Commission to organise a public debate on GMOs in food and agriculture, prior to a parliamentary decision early in 2002 about whether or not to permit field trials, commercial production, import and processing.

In the eyes of many NGOs, however, the Commission lacked the due openness and impartiality, and seemed interested only in the conditions for introducing GMOs, and not whether they should be introduced at all. The Commission's information reflected this, presenting hypothetical examples as real options, and neglecting both the proven negative impacts of gene technology, and alternative policies and practices. It also showed little sign of resolving the contradiction between several government departments promoting research and trials by biotechnology companies and one department blocking them.

A coalition of 15 NGOs, including Both ENDS, withdrew its confidence from the Commission; circulated alternative information widely; and held a conference with experts from the South.

The Coalition made plans to present recommendations to parliament before January 2002 for its discussion of the Commission's Integrated Biotechnology Policy Paper. These included an appeal to the government to follow six other European countries in signing a moratorium on GMOs.

More: **www.gentechdebat.nl**

Local seed systems in Zambia

The future is a reflection of the past

Sub-Saharan Africa has a rich variety of seeds. Characteristically these seed varieties have been low yielding, making them suitable to the dry conditions of the region. In the 1960s, Zambia, like most African countries, 'modernised' its agriculture and introduced farmers to high yielding seeds. Farmers received hybrid maize and chemical fertilisers from government operated co-operatives. This was the beginning of farmers' dependence on the state for seeds and inputs.

In the 1990s, this dependency had tragic consequences when Zambia suffered from drought. The varieties of maize used by farmers were unsuited to the dry conditions, resulting in enormous food shortages. The government's response was inadequate and NGOs moved in to assist.

In 1994, CARE-Zambia began the Livingstone Food Security Project (LFSP) which focused initially on food relief and later addressed the deeper causes of food insecurity. The LFSP has now rightly become famous worldwide for its leadership in the movement of organisations working to modernise local seed supply systems.

Farming by committee, but it works!

The LFSP program developed first in southern Zambia, one of the most drought-prone regions. CARE organised a network to build up local seed systems by introducing drought resistant seeds of millet and sorghum. A few interested farmers experimented with these seeds and good seeds were loaned out to other groups. The farmers were organised into a three-layer network. Groups of about five farmers constituted a cell; these experimented with different seeds and shared their experiences with others. Representatives of the cells united to form Village Management Committees (VMCs) which distributed seeds to the leaders of the cells. The VMCs also monitored the performance of cells and cell members, taking into account the capacity of individual farmers to manage a particular crop. As the number of VMCs grew, it became necessary to create a co-ordinating centre at the area level. Five to 15 VMCs were clustered into an Area Management Committee (AMC). By 2000, there were 669 VMCs and 62 AMCs in the region.

CARE's achievements have been several. To begin with, 97% of the targeted 160,000 people have benefited from their program. Seed bases have increased from 2 crops and 3 varieties in 1994-1995 to 11 crops and 21 varieties in 1999-2000. Improved varieties of sorghum yield two tons per hectare, as against 0.5 tons of the earlier seeds. Now there are 35 trained seed producers who supply the farmers with improved seeds. National food production has increased from 10% to 41% of food supply and food aid has decreased dramatically from 90% to 5%. The position of women has also improved. By 1999, 40% of the leading positions were occupied by women. In AMCs and VMCs, 5% of the chairpersons were women. Women also held 25% of the secretarial positions.

CARE achievements stem from its recognition that local food security is based on drawing farmers to work together to strengthen the seed base. VMCs and AMC have become focal points for community development, acting as links between various development agencies and the government. The AMCs are gradually taking over the functions of the CARE centre and are responsible for all development activities in their areas. CARE's model has been so successful in increasing food security that it is being used in other parts of Zambia.

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Biological agents in Bolivia

Promoting pest control, naturally



Photo: Probioma, Bolivia

Picudo Negro sternechus sp., a plague of soy cultivation affected by the fungus entomophagous nematodes. Top: healthy. Bottom: diseased.

A sustainable biological alternative is gaining ground in Bolivia to replace agrochemicals used for pest control. The organisation Productividad Biosfera y Medio Ambiente (PROBIOMA) has developed socalled bioregulators, based on biological agents such as fungi or parasites that are the natural enemies of pests. They are applied to vulnerable plants in solid or liquid form, and their application helps to restore natural balances in the ecosystem.

PROBIOMA started their work with farmers in the eastern Bolivian provinces of Cochabamba and Santa Cruz, the latter being one of the world's five major concentrations of biodiversity. The use of agrochemicals in Santa Cruz over recent decades has been a major cause of environmental degradation and has led to a worsening socio-economic situation for farmers who now depend on expensive, imported goods.

Reaction to chemicals

The Green Revolution's promise of higher yields came with a package of expensive chemicals and fertilisers, in Bolivia as elsewhere. There are now more than 160 different chemicals in use in the region in agriculture today; they form 26% of the total costs of cultivation of crops like soy, maize and potatoes. Ironically, the number of pests has increased as their resis-tance to pesticides has also increased.

Unlike chemical sprays and dusts, bio-regulators are inexpensive, and produced locally. Under the right conditions, they can reproduce naturally thus diminishing the permanent dependency of local farmers on external inputs. After a decade in the field, PROBIOMA now develops, produces and distributes bioregulators to control seven diseases and 40 pests; they are applicable to 38 crops. Independent field tests conducted by a government adviser showed a remarkably high level of effectiveness, from 74% to 98%. PROBIOMA have registered their products - the first such registration in Latin America. They are exported to Chile, Ecuador, Costa Rica, and Brazil.

Success is sweet

PROBIOMA's success rests on their ability to link local knowledge with scientific expertise. Farmers assist in the development and application of bioregulators and presently, 1,400 farmers in 50 communities use bioregulators. As part of the special emphasis paid to gender, in three communities women farmers were the first to apply bio-regulators to their plots. Later, PROBIOMA launched a collective scheme to train women in marketing organic foods. Now, women's groups sell organic agricultural products in town markets, and they are targeted at poor residents of the city of Santa Cruz.

Despite PROBIOMA's success, support has not been forthcoming from the Bolivian government which has little interest in organic agriculture and is putting through legislation promoting agrochemicals for increasing export production. Nevertheless, a campaign by a coalition of stakeholders has successfully led to a one-year moratorium on the introduction and field-testing of gene technology in Bolivia. Here the bioregulators of PROBIOMA have been promoted as a viable and sustainable option to gene technology.

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Moratorium campaign (UK)

Broad Alliance

Coverage of genetic engineering (GE) issues was a permanent feature of the European media during the late 1990s. Public concern about the implications for health, the environment and scientific ethics was high. It was accompanied by a string of food-related scandals - salmonella in eggs and poultry, the bacteria *E. coli*, mad cow disease and its human variant - which, while totally unrelated in scientific terms, all fed the public's uncertainty about food safety. This led to protests against GE in front of supermarkets and laboratories, but to surprisingly little public debate.

The Genetic Engineering Alliance (UK) launched the five year FREEZE campaign in 1999 to promote such debate. An essentially British campaign, rooted in trade unions, religious organisations and environmental groups, FREEZE wants a five year moratorium on growing GE crops for commercial purposes, on their imports, and on patenting genetic resources for food crops. This should allow a scientific consensus on long-term health and environmental effects to emerge.

The Alliance also questions official and industry claims that field trials will eliminate any problems caused by genetic technology. In fact, they are too short to cover sufficient cropping years or to measure long-term effects. Further, they only detect variations greater than natural variables, and they exclude such key elements in ecological assessments as earthworms and soil microbes, both vital indicators of soil health.

The campaign has successfully mobilised public energies with its multi-stakeholder approach. Over 4 million people have expressed their concern. Moratorium supporters include English Nature (official government advisors), the Consumers' and the British Medical Associations, whilst NGOs across Europe, USA, Brazil, Ethiopia, and South Africa have endorsed FREEZE.

In partnership with other campaigns, FREEZE has successfully delayed the commercial planting of GM crops in the UK and helped to maintain the de facto moratorium on approvals at European level.

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Useful Websites

ASEED Europe - Ground Up
www.groundup.org

Biodiversidad en América Latina
www.biodiversidadla.org

Cartagena Protocol on Biosafety
www.biodiv.org/biosafety

ETC - action group on Erosion, Technology and Concentration (formerly RAFI)
www.etcgroup.org

GeneWatch UK
www.genewatch.org

GRAIN Genetic Resources Action International
www.grain.org

Greenpeace International
www.greenpeace.org

Genetically engineered Food Safety Problems
www.psrast.org

International Service for the Acquisition of Agri-biotech Applications
www.isaaa.org

Biosafety WebPages
www.icgeb.trieste.it/~bsafesrv/

Monsanto vs. Schmeiser
www.percyschmeiser.com

Complete on the Web Encyclopedia of Sustainability

A comprehensive overview of all selected initiatives with detailed accounts is on the Both ENDS' website: **www.bothends.org**. Sustainable Land Use and Water Management is the 'umbrella' theme. Sub-themes are:

- Ecological Restoration
- Integrated River Basin Management
- Gene Technology in Food and Agriculture
- Non-Timber Forest Products
- Land Rights and Natural Resource Management

All case studies are in English, and where appropriate are also in Spanish, French or Bahasa Indonesia.

We welcome your contributions at: encyclopedia@bothends.org or by mail.

Both ENDS supports inspiring environmental initiatives all over the world

Encyclopedia of Sustainability NEWS is an occasional newsletter of Both ENDS, presenting selected environmental alternatives. The first newsletter was published in March 2000 and focused on Water Management. This second newsletter focuses on Gene Technology in Food and Agriculture. It was first published in December 2001 and is available free of charge. Please feel free to reproduce any article, making sure to credit the source. Please also feel free to point to our Website.

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