



Girona 25, pral., Barcelona E-08010, Spain
Tel: +34 933 011 381
Fax: +34 933 011 627
Email: seedling@grain.org
Web: www.grain.org

GRAIN is an international non-profit organisation which promotes the sustainable management and use of agricultural biodiversity based on people's control over genetic resources and local knowledge. To find out more about GRAIN, visit our website at www.grain.org.

Seedling

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Front cover picture: © Panos Pictures/Dieter Telemans: India. Shepherd with his flock in the Thar desert between Nagaur and Jaisalmer.

Back cover picture: © Panos Pictures/Alvaro Leiva: Niger. Camel and their riders at the Cure Salee (Salt Cure) festival, which celebrates their arrival at the salty grasses near Inga, salt being crucial to the survival of their herds.

Freedom from IPR

Towards a convergence of movements?

GRAIN

There has never been a time of more centralised power and control. The free space in which we can create, co-operate, learn and share with other people is diminishing by the day as we lose our ability to think and live outside the reach of transnational corporations. They own the water, they control the media and they dominate our food supply. At the core of this control is the whole system of intellectual property rights (IPR) – copyrights, patents, trademarks, broadcasters rights and so on.

IPR are now the central source of profits in the so-called “knowledge economy”, making their expansion crucial for corporations investing in new technologies and new markets across the planet. But they are killing innovation, freedom and access to essential things like culture, health and education – *our* innovations, *our* freedom, *our* education. Farmers can’t save seeds. Sick

people can’t afford drugs. Computer programmers can’t modify software. Librarians won’t let you photocopy a magazine article. Students can’t afford textbooks. Why? Because of myriad IPR laws being strengthened every day to stop you from doing things with someone else’s “creative work”. Over the past decades, the drive to privatise and criminalise everything in the name of a few companies’ supposed genius has gone too far. The backlash is inevitable.

New social spaces

Where there is oppression there is always resistance. Today, people are using all kinds of creative means to organise and push back the IPR onslaught. The free software and open source movements are directly challenging Microsoft’s monopoly practices, dodgy products and sloppy standards through their own approaches to programme development and distribution. Music enthusiasts have set up peer-to-peer networks on the internet,



"If activists, campaigners and innovators come together and formulate one common platform to rein in the IPR system, the effect could be explosive"

like Napster and Kazaa, to share digital recordings. The creative commons community is promoting alternative forms of copyright to let authors put their works in the public domain and minimise restrictions on what readers can do. Librarians are campaigning hard to save "fair use" principles in the US and Europe, while AIDS activists

throughout the world are demanding that medicine serve the health of people, not the advertising budgets of mega-drug firms. Farmers are ripping up fields of genetically modified (GM) crops, hitting back at

Monsanto's efforts to patent, contaminate and take over the seed supply that farmers themselves developed over generations. And indigenous peoples continue to fight against the intensifying theft and destruction of their knowledge.

When you put all these pieces together, it's astounding to see how many people are saying "Enough!" to the excesses of IPR laws and the ever-encroaching practices of large companies to make us pay for essential things underpinning our health, work, food, education and leisure. And a lot of that effort is not just about saying no, but developing new and often community-based means to produce and disseminate books, music, films, software, agricultural innovations and the like. Until recently, however, many of these initiatives have been growing in isolation.

People from different sectors are now realising that the new social spaces they are creating have a lot

in common, and efforts are underway to bring the various struggles together. Some people are looking at applying "open source" models – where people are free to access, modify and disseminate a product, as long as they *keep* it free – to seeds, music and even wheelchairs. Free software works, and the community of users and developers is growing by the day, so why not free the seeds? One Linux enthusiast recently mused, "Will José Bové become the Richard Stallman of the peasant sector?"¹ Vice-versa, there's talk of applying the strategy of GM-free zones to software – imagine Microsoft-free offices everywhere!

In the past few years, the potential synergy in the battle against patents on seeds and drugs has grown clear, particularly around the Trade Related Intellectual Property Rights Agreement of the World Trade Organisation. Activists have forced the issue of access to essential medicines high on the agenda of anyone discussing patent law these days. So why not forge closer links with food and seeds, as well as with traditional medicine and traditional knowledge? Consumers movements are also starting to draw the links between these different elements. Many have been fighting drug patents for a while. But software patents and digital rights are a new problem, biopiracy is hitting the radar as a threat to food security and traditional knowledge is also coming into the picture. In September 2004, the Trans Atlantic Consumer Dialogue, which is coordinated by the NGO Consumers International, held a large two-day meeting in Geneva on all of these questions, focusing on the role of World Intellectual Property Organisation.

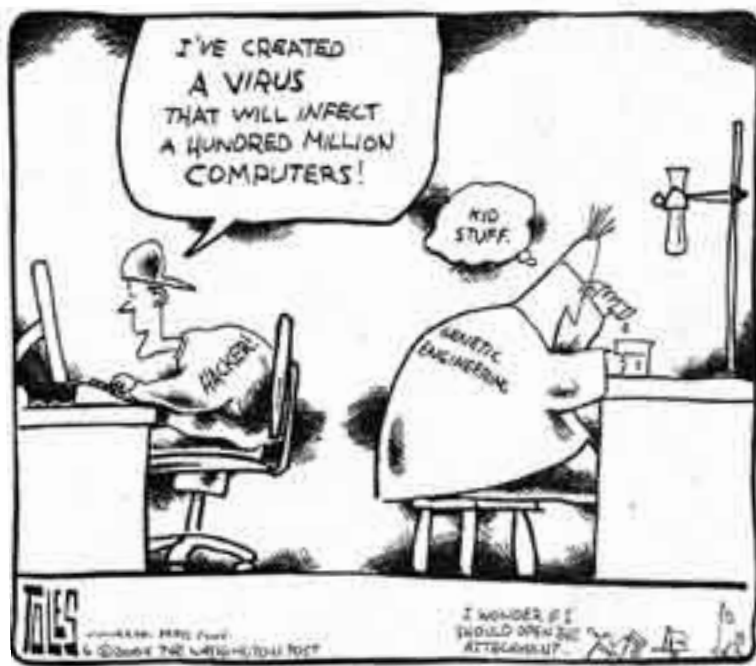
Finally, copyright activists and the digital rights community are also seeing connections between their arenas of struggle – both are concerned with promoting sharing and protecting the public domain – and what is happening with the patent clampdown on software, seeds and medicine.

All of these various movements are supported and sustained by grassroots activism in the broad but critical area of information technology, communications and media, where people are claiming and building the space, capacity and freedom to share information outside of the mainstream sources that are monopolised by a few multimedia giants. Community radio networks like AMARC and alternative media movements like Indymedia, for instance, are breaking important ground in this direction for the benefit of social movements across the planet. In the face of intellectual property rights, they

¹ Bové is a peasant leader with La Confédération Paysanne: www.confederationpaysanne.fr. Stallman is the founder of the free software movement: www.gnu.org.

² For a more detailed discussion on the commonalities and differences between public domain and the commons, see Brewster Kneen, "Redefining 'property': Private property, the commons and the public domain", *Seedling*, January 2004, p1. www.grain.org/seedling/?id=258

³ Martin Khor, "Hue and Cry Over Copyrights", *The Star Online*, September 27, 2004, <http://202.186.86.35/news/story.asp?file=/2004/9/27/focus/8986541>



are campaigning for “communication rights” as a human right threatened by corporate interests, privatisation and monopoly control through both technology and law.

These are all very encouraging signs that point to a possible convergence of movements. If activists, campaigners, and innovators working on free software, no-patents-on-life, access to generic drugs, traditional medicine, digital rights, peer-to-peer networking and “fair use” came together and formulated one common platform to rein in the IPR system, the effect could be explosive. For sure, the pieces would not fit perfectly together. There are differences driving these different sectors and their struggles that need to be properly understood and respected. But if these differences are handled well, a powerful mass movement could emerge.

Differences we may face

One warning flag might crop up around the notion of “public domain” or “commons”. Some people assume that both are inherently good. There is a tendency to use the terms interchangeably and see them as the answer to privatisation.² But many indigenous peoples have serious problems with these concepts for historical and ongoing reasons. And it’s not clear for many people what these concepts mean and who defines them. It’s one thing if putting a book in the public domain means anyone can use or print it. It’s quite another if putting seeds in the public domain means Monsanto can inject them with Terminator genes to destroy peasant agriculture.

Another warning flag might be on the issue of using licenses as a tool to protect cultures of sharing. Open source licensing tries to articulate permissions (what you can do), rather than prohibitions (what you can’t do). Still, some people might find it hard to see what licensing – whether a set of do’s or don’ts – has to do with freedom.

Others might ask whether it doesn’t actually reinforce the system that it is meant to challenge. For example, an open source type of license may be non-monopolistic but still express ownership, when ownership may not be the point for some people (e.g. small farmers), or it may be something that others really want to avoid (e.g. indigenous peoples). It can also be impractical. Imagine a typical farmer in Mali using a license to protect her seeds when bioprospectors come around!

In the same way, there are flags of caution already draping the word “open” as in open source, open education or even open agriculture. Openness

English Nursery Rhyme - circa 1764

They hang the man and flog the woman
That steal the goose from off the common,
But let the greater villain loose
That steals the common from the goose.

The law demands that we atone
When we take things we do not own,
But leaves the lords and ladies fine
Who take things that are yours and mine.

Jargon Buster

Copyright protects the concrete expression of an idea and not the idea itself. It protects musical, literary, scientific works, computer software, plays, lectures, etc. that are fixed in tangible or material form. It also gives protection to dance moves, riffs, html coding recorded in any given medium. Copyright has its origins in the late 16th century and gives authors rights over their creation for a limited period of time, after which the work becomes part of the public domain. Today, copyright functions mainly as a tool for securing the property interests of corporations. In the US the term for copyright has been extended on eleven occasions since 1960. Today the basic copyright term in Europe and the US is the life of the author plus 70 years, but – thanks to a 1998 extension – works belonging to corporations are protected for 95 years.

Copyleft describes the deliberate attempt to create the space for and the use of non-proprietary software through the sharing of software programmes and its codes, and the collaborative development of software. It recognises the centrality of prior ideas as the basis for all creativity. Copyleft gives users the freedom to redistribute software and alter/improve its codes as long as the freedom to copy and change is passed on to every user. The GNU Project is one of the better examples of the copyleft movement.

Fair Use is the right to use a copyrighted work for educational, academic, or research purposes. The Fair Use doctrine has come under serious threat in the USA as a result of the Digital Millennium Copyright Act (2000), which includes a swathe of restrictive clauses related to the use of copyrighted material with major consequences for public libraries, educational institutions and home use.

Open Source is an approach to developing collaborative, non-proprietary software based on the non-exclusive appropriation of source code.

Public Domain refers to the social and cultural space that is commonly shared by communities throughout the world, and the ideas, principles, artefacts and applications that belong to this space. Today, it also refers to virtual spaces and digital media environments where people freely create, appropriate, interact. The public domain used to be the space for non-copyrighted works like Shakespeare and the Koran, for those works that were no longer copyright and for traditional knowledge that was orally transmitted and not fixed in a tangible form. This space is rapidly shrinking today.

Source: Pradip Thomas, *Intellectual Property Rights (IPR) and Communication: A glossary of terms*, WACC, Jan 1, 2004. www.wacc.org.uk/modules.php?name=News&file=article&sid=808



provides access, but it doesn't necessarily provide power or choice or control. In short, open may not mean free. The question of property is also tricky. Most movements would probably all agree on the fight against monopolies, but what about property? Who will cling to it as necessary, who will give it up and who is not interested in it to begin with? And then there is the question of whether the IPR and non-IPR worlds can live together in the different sectors: whether free software or free seeds can co-exist with their patented versions. For

instance, IPR in crop development has brought us genetic erosion and genetic contamination, physically undermining the future for *any* kind of breeding, free or unfree. Yet we haven't lost words because of copyright. And neither the existence nor dominance of Microsoft's proprietary code is stopping Mozilla.

Towards a convergence of movements

These are just warning flags – differences to be aware of – not walls. They should not let us lose sight of the enormous potential of bringing the various movements together. Wherever and whenever possible, efforts in this direction should be supported. We need to reach out to each other, build bridges, discuss mutual commonalities and differences and build joint strategies. Too many basic acts of every day life – sharing and saving seeds, finding affordable health treatment and education, copying books, swapping CDs, watching television, improving computer programmes, etc are either becoming really expensive or outlawed and controlled by a smaller and smaller number of conglomerates trying to secure a captive world market.

The words common to our various struggles might be: community, sharing, freedom, collaboration, choice, diversity. Those are definitely not the words of the IPR emperors, the Microsofts, Monsantos and IBMs. And we may find that, if we build a strong enough movement to reject their monopoly claims across the board – whether patents on rice or trademarks on the colour purple – the emperors have no clothes. For their demands are only as good as we accept them. If we stand together, their chains of monopoly control would fall apart.

GRAIN is starting to look more closely at the potential for "convergence" between these different struggles against IPR. We aim to publish more analysis, viewpoints and strategy ideas about it in future issues of Seedling. If you have materials to contribute, proposals to share or want to get involved in any other way, please contact us.

Going further

Organisations

Creative Commons: www.creativecommons.org
Promoting alternatives to copyright

Electronic Frontiers Foundation: www.eff.org
Protecting people's digital rights.

Free Software Foundation: www.gnu.org
Home of the free software movement and the original General Public License ('copyleft')

Open Source Initiative: www.opensource.org
A centralised approach to defining and certifying 'open source'

Union for the Public Domain: www.public-domain.org
Protecting and enhancing the public domain in matters concerning intellectual property

Information Commons: www.info-commons.org/
Has excellent links on its Resources page

Readings, viewings and initiatives

Lawrence Lessig's blogs: www.lessig.org
Speaking up against copyright

Free culture: <http://randomfoo.net/freeculture>
Lessig's Flash presentation on the history and ills of modern copyright

Freeculture.org: www.freeculture.org
An international student movement to free culture

Wikipedia: www.wikipedia.org
An example of open source collaboration at work

Firefox: www.mozilla.org/products/firefox/
Mozilla's Firefox web browser is another example of open source collaboration at work

BioLinux: www.sarai.net/journal/02PDF/10infopol/09biolinux.pdf

Linux and seeds, geeks and farmers: a spiritual link: <http://www.a42.com/node/view/343>

Open source seeds? www.a42.com/node/view/308

Open source life: <http://mind-brain.com/forum/index.php?s=2e65f0f33e314ac32c2b34d9a180712b&showtopic=6351&st=0&#entry27591>

What is OSS? <http://advocacydev.blueoxen.net/cgi-bin/wiki.pl?WhatIsOSS>



Soybean production in Argentina has increased from 0.01 million to more than 14 million hectares in 30 years, making it the world's third largest producer. The rise of the soybean has been accompanied by massive increases in hunger and malnutrition in a country long accustomed to producing 10 times as much food as the population required. The consequences of growing GM soya include a massive exodus from the countryside and ecological devastation. Now soya is being imposed on Argentines as an alternative to traditional foods. Despite all indications to the contrary, the government continues to see the export of GM soya as key to servicing the country's massive debt.

Argentina's torrid love affair with the soybean



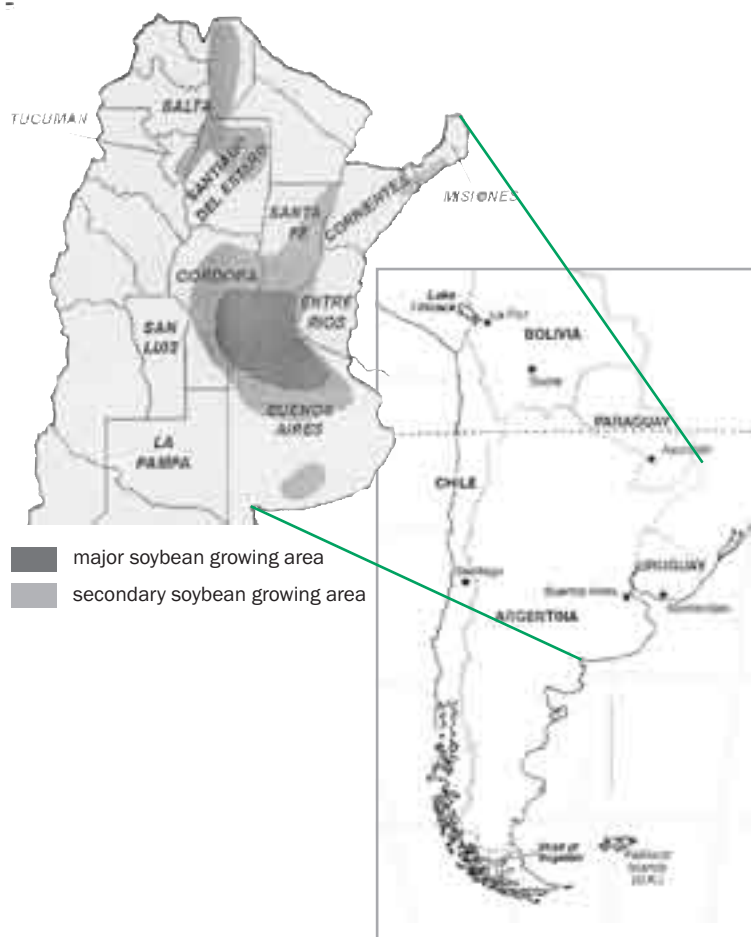
LILIAN JOENSEN AND STELLA SEMINO

Argentina assumed the role of an exporter of raw materials, mainly agricultural products, and an importer of manufactured products during the 19th Century, as required by its colonial masters. In 1853 the country was unified and the process of internal colonisation accelerated, via initiatives like the "conquest of the desert", which involved forcibly removing indigenous peoples from land required for agriculture. The government also adopted an economic model to facilitate exports and began to contract debt. But although Argentina was exporting agricultural produce, much of it to the UK, there were many differences between the impact then and now. Then it was mainly producing food for internal consumption, there

were no toxic chemicals being applied, people were able to save their seed and make their own farming decisions, and there was plenty of employment.

In 1890, the country suffered an economic collapse and the peso was devalued against the price of gold, which actually helped exports, while the entry of foreign currency ensured a rapid recovery. After 1890, UK interests in the country shifted and investment focused on the railways. Between 1880 and 1913, investment in the railways increased 30 fold and millions of railway sleepers were produced by itinerant workers from the forests of North East Argentina. Railways were not routed to facilitate the movement of Argentines but of commodities to the ports (Buenos Aires and Rosario). Today's parallel is the construction of the "Hidrovía" waterway, the massive intergovernmental project

The major soybean growing areas in Argentina



to build canals and link rivers so as to open up the whole continent to big cargo vessels to take out products. Grain and fertilisers are predicted to make up 48% of the goods carried. US companies plan to transport 70,000 tonnes of oilseeds (including soya) daily for processing at the industrial centre ROSAFE close to the port of Rosario.

“The economy finally collapsed in 2001, and this time the peso was devalued against the dollar, which in turn helped to promote the export of GM soya.”

One of the architects of Argentina’s agricultural modernisation, José Martínez de Hoz, wrote a book in 1967 renewing the call for Argentina to base its economy on industrial export agriculture. The green revolution began with the importing of hybrid seed and chemical fertilisers and machinery. Most of the production was consumed internally as international prices did not favour exports. In 1984 the new democratic government sought to promote fertiliser use by exchanging fertiliser for grain. The country’s debt had increased greatly under the military dictatorship of 1976-83. In spite of this the new government

was able to attract loans from the World Bank, the International Monetary Fund (IMF) and the Club of Paris. Rapid returns attracted investment and financial speculation on a large scale became an important part of the economy. During this period power was concentrated increasingly in the hands of a small elite.

Between 1983 and 1989 there was hyperinflation, fuelled by speculation on the peso versus the dollar and not helped by low international prices for exports. In 1989 the fiscal system collapsed, together with incomes, while national industry continued to decline. The economic chaos, de-industrialisation, concentration of the economy in few hands, was the perfect context for ushering in the presidency of Carlos Menem (1989-2000). His proposal to turn Argentina into a first world country and reduce its debt through a savage neoliberal programme was welcomed as a possible way out. Menem’s stated aims were to cut state expenditures and privatise as much as possible (even scientific research), to make public services “more efficient”. He followed the World Bank, the IMF and the Inter-American Development Bank’s standard prescription. This meant monetary reform, fiscal reform, reducing taxes and restrictions on imports and exports; reform (privatisation) of the public sector, including the social support system, education and pensions.

But instead of dwindling, the debt tripled, reaching \$US 145,000 million in 1999, and the situation was exacerbated by capital flight on a massive scale. At the same time, national industry was decimated, unable to compete with cheap imports. Argentina once more found itself exporting raw materials and importing finished goods made from them. The economy finally collapsed in 2001, and this time the peso was devalued against the dollar, which in turn helped to promote the export of GM soya.

Opening the door to GM soybeans

Between 1991 and 2002, 569 field trials on genetically modified (GM) crops were approved in Argentina, including maize, sunflower, soya, cotton and some wheat, potatoes and alfalfa. No information was given to the public or to Congress about what was happening. The Advisory Commission on Biotechnology included biotech companies like Monsanto, Syngenta, Dow AgroSciences, and Bayer CropScience. In 1996, the government gave a licence to Monsanto to grow GM soya. At that point, international prices for soya were high. Monsanto was not able to charge royalties because they had not been granted a patent on the gene for glyphosate



resistance in Argentina, which meant that farmers were able to save their seed from season to season. Moreover glyphosate was cheap, all of which gave Argentina a distinct advantage in international sales. Since credit was hard to obtain, producers were instead given packages of seed and inputs by the distributors of seed and chemicals, which they paid for after the harvest. Grain companies also rented land to grow soya. Over the next few years, GM soya seed was smuggled and grown illegally in Brazil, Paraguay, Uruguay and Bolivia. Having succeeded in ensuring that GM soybean was cultivated throughout the region, Monsanto then demanded royalties. In Argentina, a tax is being levied on wheat and soybean seed and the proceeds shared by the companies involved.

The production of soybeans in Argentina has expanded from 9,500 hectares in the early 1970s to 5.9 million in 1996, 10.3 million in 2000-1 and 14.1 million in 2003-4, almost all of which is GM (some estimates are as high as 97%). However, even though the area under cultivation rose by 1.5 million hectares between 2002-3, at the expense of other crops and forest clearance, production fell slightly, from 34.80 million tonnes to 34.77 million tonnes, because overall productivity fell by about 10.5%. The government is unwilling to acknowledge that there is a problem because it sees the income from GM soya as the main way to service the country's massive debt.

Rural exodus and the growth of poverty

In 1992, the Argentine government declared that 200,000 producers would have to leave farming and that farming units of less than 200 hectares were uneconomic. Small farmers have found it extremely difficult to compete given the economic conditions in the country and the advent of GM soybeans has increased the pressure. Almost no labour is required for directly sown GM soybeans, small farmers cannot afford the massive machines used for the direct drilling technique that GM soybeans require (see box) and many people have sold or rented their land and left for slums in the cities. Others have been driven out with threats and violence. Land has been acquired by "sowing pools", investor groups that have replaced contractors and bring in their own employees to grow soybeans.

Food sovereignty in Argentina is seriously threatened by the export model exemplified by soybeans. The Argentine diet used to include plenty of cheap meat, dairy produce, lentils, beans and other vegetables. Mixed farming, with animals and crops, using rotation, provided good yields, but received no support from the government. In

Direct drilling

Direct drilling (along with its minor variants known as 'no-till', 'lo-till' and 'conservation tillage'), was introduced in the US to save time and money for farmers, and also to counter erosion. The land is not ploughed, but instead the farmer uses a single machine to partly incorporate the crop residue into the top few centimetres of soil, drill in the seed and press down the soil. With the machinery developed for the purpose, everything can be done in a single operation by one man. The rotting crop residues mean that slug pellets and other pesticides may be required to tackle the pests that flourish in them.

Although perhaps not originally developed to promote chemicals, direct drilling has now become widely associated with the use of herbicides, particularly glyphosate, to tackle the weeds that flourish in the system. In the case of GM crops, spraying can continue while the crop is growing, instead of only before it emerges. Using massive machines, a single producer can plant soybeans thousands of acres, yielding large returns for the big farmer. However, the small farmer cannot afford the machinery required and may be forced into quitting his land or renting it to the sowing pools. The technique of direct drilling has been adopted widely in USA, Canada, Australia, Chile, Brazil and Argentina and is now being promoted all over the world.

One of the problems with soybeans in this system is that the residue after harvest is very sparse and so the soil is left exposed to erosion and poorly nourished. Modern soybean varieties are extremely efficient at extracting nutrients from the soil, so the crop flourishes when first planted in areas where forest has been cleared, but soon exhausts the land, while its residues give very little back. Chemical fertilisers and pesticides and the huge areas cleared make it almost impossible for native vegetation to re-establish itself. Desertification soon follows.

Another problem arising from the direct drilling system is that it has resulted in a plague of *Phakopsora pachyrhizi* (Asian rust fungus), which only appeared in Argentina in 2001 and can reduce production by up to 80%. The spores survive to the next season in the vegetation left on the surface in direct drilling and are also dispersed widely by the wind. Scientific research also suggests that glyphosate makes plants more susceptible to certain diseases (eg fusarium fungus) by mechanisms which are now being investigated.



recent years, soybeans have replaced the production of food staples, which are now being imported at much higher prices for consumers. In fifteen years Argentinean dairy farms have halved in number, from 30,000 in 1988 to 15,000 in 2003. Higher priced milk is now being imported from Uruguay.

The population of Argentina is predominantly urban, so the rural crisis remained invisible for a long time. Nobody believed there could be hunger in a country that produced so much food. But economic crashes, the reform of the public sector, the fall in wages, the destruction of national industries, the replacement of national food crops with GM soybeans for export and the rural exodus have been disastrous. The percent of the population below the poverty line was only 5% in 1970. It rose

"In February 2003, peasants found their crops destroyed by glyphosate sprayed from the air. Their chickens died, and other animals were adversely affected."

to 12% in 1980, 30% in 1998 and 51% in 2002. Malnutrition among infants is between 11% and 17% and rising.

In some regions, GM soybeans are exacerbating old injustices.

In the 19th century, the region of Santiago del Estero supplied the rest of the country with agricultural products. The beginning of the 20th century saw the massive extraction of timber to make more than 20 million sleepers for the new railway system. Much of the mobile labour force that carried out this work settled on the land afterwards. The law says that if people settle on a piece of land for 20 years it becomes theirs, but the process of proof is complex. The province has long been subject to almost feudal rule, with rampant deforestation and the concentration of land in the hands of the few. Many long-established peasant communities have been approached by someone who claims to own their land. If they refuse to leave, armed groups may steal their cattle, burn their crops and threaten them with violence. Once they are dislodged, the situation

is generally irreversible. A peasant organisation, MOCASE, has been formed to defend people's rights, with some success. The lure of profits from GM soybeans is the latest and most intense threat to their livelihoods.

New pest and weed problems

Due to the technique of direct drilling, there are new problems with disease. The fungus *Phakopsora pachyrhizi* (soybean rust) has been spreading and is also showing up in Brazil and Paraguay. Weed communities are showing increasing tolerance to glyphosate. This means that producers are now having to use an extremely toxic mix of 2,4.D, metsulfuron methyl, imazetapir and atrazine in addition to glyphosate, plus paraquat and atrazine to deal with soybean volunteers.

In December 2003 Syngenta, which produces paraquat and atrazine, as well as fungicides, declared Argentina, Brazil, Paraguay, Bolivia and Uruguay the "United Republic of Soya". In Paraguay, where GM soybean planting has not been legalised, peasants who gathered to protest about the spraying of illegal soybean fields were shot at by police.

Argentina's troubles do not end with soybeans. In July 2004, Monsanto's RoundUp Ready maize (NK603) was approved for commercial cultivation in Argentina. The company presents it as the 'solution' to the problems that arise when trying to spray GM soybeans without damaging conventional (glyphosate-sensitive) maize. It also promises that planting GM maize will reduce herbicide applications and thus the cost to the producer. When the European Union, which imports some two million tonnes of maize from Argentina appeared ready to reject GM maize, Monsanto recommended that Argentina's GM maize should be put to use domestically. But in July 2004 the EU finally approved NK603 maize for import and processing, just a few days after it was approved in Argentina. At that point Monsanto's share price rose to US\$ 36.

Human and environmental costs

Communities close to soybean cultivation have been seriously affected by the aerial spraying of herbicides, mostly glyphosate. One study in Loma Senes, Formosa, involved peasants with an average of 10 hectares of land who planted cotton until the price fell. They now grow mixed vegetables for their own consumption, selling any excess. Large areas of land around their holdings have been rented out for soybean production by direct drilling. In February 2003, the peasants found their crops



The "United Republic of Soya" - ruled by corporations, and where national boundaries become irrelevant. "Soya knows no boundaries", says Syngenta.

destroyed by glyphosate sprayed from the air. Their chickens died, and other animals, especially horses, were adversely affected. People suffered from nausea, vomiting, diarrhoea, stomach pains, skin lesions, allergies and eye irritation. They succeeded in stopping the spraying for a few months, with the help of their local organisation, MOCAFOR, but it has since been resumed. Similar cases have been reported from many parts of the country, and there are also cases involving other chemicals like 2,4.D.

High levels of deforestation for soybeans cultivation have been reported from the Yungas and Chaco regions, facilitated by good prices, high levels of investment, better roads and more powerful machinery. This has led to an increase in cases of leishmaniasis (a parasitic infection transmitted by sandflies). Treatment is relatively expensive and re-infection is common, leading to terrible scars and deformities. In Entre Rios, where an order forbidding deforestation was implemented in October 2003, almost 1.2 million hectares of forest has been removed in the last few years, due in part to a doubling in the area of soybean production (0.6-1.2 million hectares) between 1994 to 2003. Up to 30% of soybean production in the area is now carried out by sowing pools. In all these regions, the loss of biodiversity is catastrophic.

Soybean as the solution to hunger?

Over the last few years, as resistance to GM soybeans has grown outside Argentina, domestic propaganda to promote soya as the solution to problems, especially hunger, has increased. At the end of 2001, the Argentine Association of Direct Drilling Producers launched a "Soya Solidarity" campaign, through which for every tonne of soybeans exported, 1 kg was 'donated' to feed hungry people. In fact, although it was given free at first, later it was sold. At the same time, great efforts were made to promote soybeans as a safe and nutritious substitute for – and even superior to – meat, milk and eggs. Since soybean had never formed part of the Argentine diet and nobody knew how to use it, recipes were produced for making dishes using soybeans instead of meat, eggs or milk. But children did not like soybeans and many public projects gave up using it although it was cheap. The government continued to provide the information that soymilk should not be given to children under five and only to the those under two with doctors' advice. Yet it did nothing to oppose the promotion of soybeans, even though the National Forum for a Feeding and Nutrition Plan made it clear that soya is not good for bone development; that it contains little iron, and the kind of iron it does contain is difficult for the

body to utilise, and that its protein needs to be complemented with protein from other sources.

Meanwhile, the church is involved in the charitable efforts of Soya Solidarity to feed the poor with soybeans and DuPont has pledged assistance through its "Protein for Life" programme. The Food Bank Project, started in 2000, collects unsold food stocks from companies for distribution (including Kraft Argentina, Nestlé Argentina and Procter and Gamble). It has been experimenting, along with DuPont and the National Scientific and Technical Investigation Council of Argentina, with ways of mixing in other foods to improve the nutritional value and taste of soybeans. DuPont is providing food fortified with soya protein to 3,500 poor people in the Buenos Aires region.

Facing up to stark realities

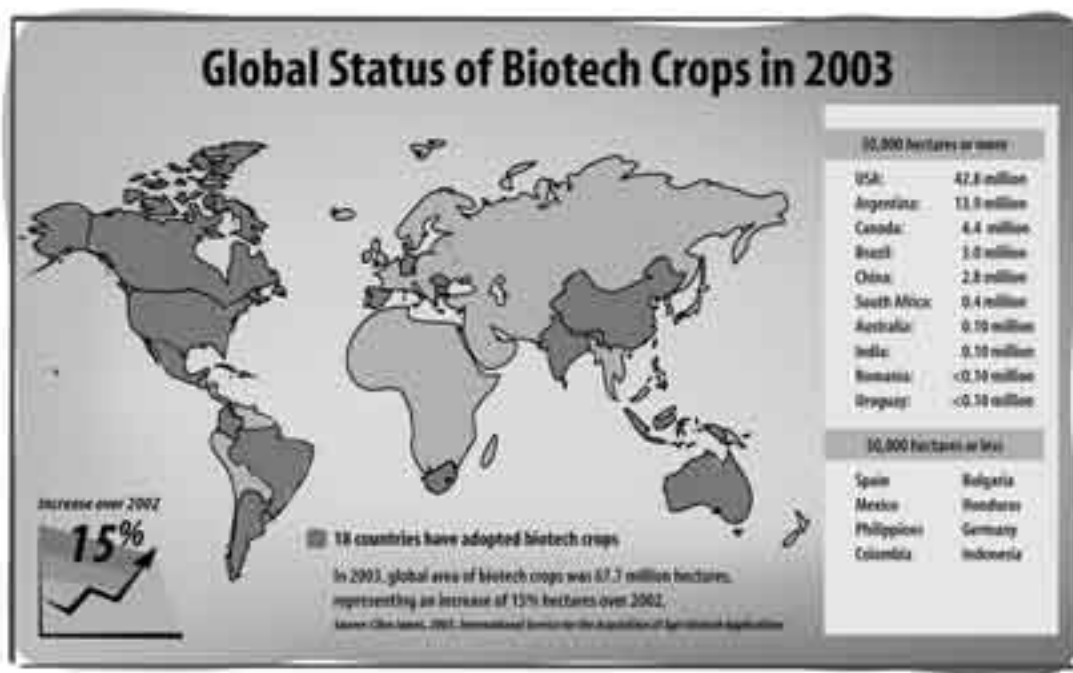
Some NGOs are exploring the possibility of sustainable soybean production. This case study demonstrates that it is simply not possible. Nor is the production of GM crops a solution to hunger. Quite the opposite: as GM soybean production has grown, hunger has skyrocketed to levels never seen before. Any idea that the use of agrochemicals would be reduced is also an illusion. Argentinean agriculture has not only become dependent on

"As resistance to GM soybeans has grown outside Argentina, domestic propaganda to promote soya as the solution to problems, especially hunger, has increased."



Soya is recognised as being unsuitable for children under five, and yet it is being fiercely promoted for all children.





Thanks to its obsession with GM soybeans, Argentina ranks second in the global GM crop hall of fame

inputs, but is also using pesticides which are prohibited elsewhere. The so-called 'free market' has meant that corporations oblige Argentina to produce commodities for other countries, at the expense of its own natural resources and future generations. This is all in order to pay debts which were illegally contracted with the connivance

of the international institutions that promote the opening up of countries to free trade. The catastrophe unfolding in Argentina shows that GM crops are a tool for domination through creating hunger and dependency. The Argentine case should sound the alarm for any people seeking to defend their own food security and sovereignty.



This article is the summary of a longer case study entitled "Argentina: Case study on the impact of RoundUp Ready soya". The full study is available from the Gaia Foundation at gaia@gaianet.org or from 18 Well Walk, London NW3 1LD, UK, Fax: +44 171 431 0551. It was written by **Lillian Joensen** and **Stella Semino** of the Rural Reflection Group, Argentina, with Helena Paul of EcoNexus, UK. Stella (left) has a background in community development. From 1998 to 2003 she worked for the Argentinean National Congress first on community development and then on issues related to our external public debt, which was how she became concerned

about how the production of GM soya was being linked to debt servicing. Lillian (right) is a molecular biologist who has been working on Chagas' disease in Argentina. Says Lillian, "As a biologist that uses biotechnology as one of the many tools in my basic research, I believe (as most biologists do when we speak inside the lab) that the use of genetic modification in agriculture and the invasion of nature by these organisms is at least huge irresponsible and dangerous, since there is no way to control the further effects, once the GM organisms have been released". The authors can be contacted directly by email at stella.semino@mail.dk and lilianj16@yahoo.com.

The Raika represent one of the largest groups of livestock herders in India. Through their innovativeness, flexibility and specialised knowledge, they have managed to thrive in a harsh, semi-desert environment. They have developed hardy livestock breeds and a complex social web that revolves around their animals. But external factors are pushing the Raika to the limits of their resourcefulness and threatening their livelihood with extinction.

The black sheep of Rajasthan

ELLEN GEERLINGS

The Raika or Rebari are one of the largest groups of livestock herders inhabiting the western districts of Rajasthan and Gujarat in India, including the great Thar desert. Their population is estimated to be somewhere between one quarter and half a million people. The Raika were the traditional caretakers of the camel herds belonging to the Maharajahs. When the royal camel establishments were dissolved in the first half of the 20th century, many of the camels passed into ownership of the Raika, who switched to producing camels for the emerging market in draught animals¹. Nowadays, camels are kept by a relatively small number of Raika families, while sheep and goat husbandry is practiced by the vast

majority to service a growing meat market. Rajasthan hosts 20-30% of India's sheep and goat population, and the region produces 40% of the country's mutton and 42% of its wool. About 70% of India's camels are found in Rajasthan, the vast majority of which are kept by the Raika. Although the Raika derive their main income from selling (male) lambs and kids for slaughter, they also sell or exchange dung and wool. Surplus milk is used to make tea or ghee.

The Raika began keeping sheep about 200 to 250 years ago. During this time they have influenced and developed the traits of their sheep by selective breeding and recently by cross-breeding with other breeds. In this way they have developed

¹ Ilse Köhler-Rollefson, "From royal camel tenders to dairymen: occupational changes within the Raikas". In Eds. H Rakish and J Rajendra: *Desert, Drought and Development: Studies in resource management and sustainability*, Institute of Rajasthan Studies, Jaipur, 1999.





The Raika live in the western parts of the Indian states of Rajasthan and Gujarat

hardy breeds that are drought resistant, capable of walking long distances and able to produce lambs for slaughter. The Raika have developed their own system of animal healthcare making use of plant, animal and mineral based remedies, conventional drugs and traditional healers.

Sheep husbandry and specifically breeding are generally regarded as men's domain, but it is really a system dependent on the labour of all members of the household. Often overlooked is the key role women play in terms of food production, maintaining agro-biodiversity, and providing labour. They also offer specialised knowledge in certain areas of animal husbandry and have specific decision-making roles. Raika herds are passed down from father to son. Many generations of Raika took pride in their occupation and were able to make a good living out of sheep and goat husbandry. But young Raika men are not as keen as their forefathers to take up pastoralism. Despite a growing demand for animal products such as meat and ghee, there are several factors that challenge the pastoralist lifestyle. In the past the Raika were able to overcome many bottlenecks and challenges because of their innovativeness,

flexibility and expertise. But now the solutions seem to lie increasingly beyond the reach of the Raika, entangled in a complex mix of local politics, unfavourable national agricultural policies and conflicting interests within the Raika themselves.

A migratory life

Raika sheep and goat herds vary widely in size from 20 to 200 head of sheep and generally a smaller number of goats. Large herds (about 140 head of sheep or more) are taken on migration for two to ten months. Smaller herds remain in the area since the benefits of migration do not outweigh the costs of transportation, food, bribing officials and so on. These herds are taken out for grazing on a daily basis. During the dry season (October-May) sheep are grazed on agricultural and common lands, and in the rainy season (June-September) they are commonly taken to the forest. Most households supplement the herd's feed, especially during the dry months, with straw, maize, soybean, cottonseed, buttermilk, sorghum, millet, ghee and vegetable oil. In the winter, women often collect, grind and boil the seeds of 'Deshi Babul' (*Acacia nilotica*) and 'Angrezi Babul' (*Prosopis juliflora*) as a nutritional supplement for the animals. Despite their migratory lifestyle, the Raika also engage in crop production. Many Raika own or rent a small piece of land for crop production, or sharecrop with others. The primary staples are wheat and maize, followed by sorghum, lentils and vegetables. These crops are used for home consumption or animal fodder, and some may be sold locally.

Breeding strategies

Most households breed their own stud ram or rams, and the Raika follow a very careful selection process, which involves both men and women. They evaluate and inspect all close family members, especially the ram lamb's mother, using a system called *nav guna*, meaning "nine qualities". The mother of the ram lamb is assessed according to several criteria, the most important of which is milk production (see Table 1 on p 14).

The selected ram lamb is given extra care by allowing it to drink all its mother's milk and sometimes supplementing with milk from other ewes or does. The lamb is given oil and turmeric and sometimes ghee, eggs and extra fodder. The Raika restrain their ram from mating during particular months of the year so that lambs are born in or after the rainy season when there is enough forage to graze on². The stud ram is used for about three years, after which it is sold, exchanged or given away. Most households keep more than one breeding ram depending on the herd size. One ram



² Ellen Geerlings, *Sheep husbandry and Ethnoveterinary knowledge of Raika sheep pastoralists in Rajasthan, India*. MSc thesis. Environmental Sciences, Wageningen University, The Netherlands, 2001. www.pastoralpeoples.org

can serve approximately 40 ewes. Ram lambs not suited for breeding are sold for slaughter between 4 and 8 months, and some become devotional rams that are never slaughtered or sold.

Most Raika have observed that breeding with cross-breeds generation after generation results in sheep that become weaker, less productive and less disease resistant. To counter this, the Raika change their herd composition by selling old and sick adult female crossbreeds and start breeding with a *Boti* ram. By backcrossing with *Boti* breed, the herd can again become almost pure bred *Boti* sheep again after some years.

Shifting preferences

The *Boti* breed was abundant until several decades ago. But once people started bringing *Bhagli* and *Dumi* sheep back with them from their migrations, a preference for these large, exotic breeds emerged because they were bigger, fast growing and produced more meat and milk. Slowly the exotic breeds were crossbred with *Boti* sheep and the herd composition changed in favour of the higher-producing breeds. The *Bhagli*, and to a lower extent the *Dumi* breed, enabled the Raika to breed selectively for meat production. This specialisation led to a decrease of the multipurpose *Boti* breed. But over the last decade the Raika have observed that the *Bhagli* and *Dumi* (cross-)breeds do not produce as well as they once did and they have difficulties coping with ongoing drought and disease pressure. As a result the Raika are shifting their preference back to the *Boti* breed. Unfortunately there are now very few pure *Boti* sheep left. This regained interest has been triggered by several recent developments, including long drought periods in the last ten years, overpopulation, increasing disease pressure, decrease in fodder resources and longer migration routes because irrigated fields get in the way of migration routes and do not allow sheep to graze on the stubble.

The *Boti*'s hardiness and drought and disease resistance, good walking abilities and milk persistence are especially important in the dry season and during migration. The multipurpose character of the *Boti* breed is important because it offers a way of spreading risks by generating income from different products. But in areas where there is no lack of grazing land and good access to grazing resources the Raika still prefer the exotics. Personal preferences, aesthetics and family traditions also play a role in determining the breeds that the Raika keep.

Raika breeds and their characteristics

The majority of sheep found in the study area are cross-breeds (*Bhildami*), which originate from three pure bred sheep, namely:



1) The *Boti* ("small eared") sheep (officially known as the *Marwari* breed) has very short ears and its black face, and is a small to medium sized sheep. The *Boti* (cross-)breed is the most abundant breed and is rated best by the Raika for wool quality and hardiness. In times of extreme drought,

heat and fodder shortages this breed is said to have the best chance of survival because of its ability to sustain itself on little and low quality fodder. The *Boti* needs little water and is capable of walking long distances over rough terrain, a quality especially appreciated by Raika who take their sheep on migration. The *Boti* generally yields 50-200 grammes of milk per day during lactation, but it can produce up to 500 grammes under favourable conditions. Wool production ranges from 500 to 1000 grammes per shearing. The *Boti* breed has a relatively short pregnancy compared to the other breeds and generally has one lamb per lambing. The growth rate of the lambs is relatively slow because of low milk production, but ewes go on producing milk well into dry season when other breeds have stopped. This breed produces the highest number of lambs during its life (up to 11) because of short parturition intervals and its long productive life span.



2) The *Bhagli* breed (officially known as *Sonadi*) is the second most abundant breed and originated from the state of Madhya Pradesh. Some 20-30 years ago Raika started bringing this sheep back with them from migration and started to crossbreed it. The

Bhagli sheep is medium to large in size, with long, broad ears and big head. The ears often display ear nodes. The Raika appreciate this breed for its high milk and meat production, and it yields 250-500 grammes of milk during lactation. In contrast with the *Boti* breed, the *Bhagli* needs more fodder of better quality to sustain it. Ewes produce up to eight lambs during their lifetime.



3) The *Dumi* breed is a large sheep originating in Gujarat, and has a cream to reddish to dark brown face with a typical roman nose. It is a big milk producer (500-1000 grammes per day). It also produces good quality wool (though not as good as the *Boti*) being soft, long and dense. *Dumi* sheep

produce 1-1.5 kg of wool per shearing. This breed is especially kept for meat production. This breed is said to be less selective than the *Bhagli*, eating everything that is available during grazing.



**Table 1. Qualities that are looked for in a stud ram lamb's mother**

	Quality	Explanation	Times cited
1	Milk production	High quantity and quality of milk. Milk persistence is highly valued, as is the quality of the first milk	18
2	Big and strong body	Muscle and meaty backside, indicating meat quality and quantity	16
3	Wool production	High quantity and quality of wool; fine wool is preferred	16
4	Long strong legs	Indicating good walking ability	12
5	Big udder/long spleen	Indicating high milk production and facilitating milking for humans and lambs	8
6	Health, vitality and general appearance		7
7	Black face	Indicating preference for the local <i>Boti</i> breed	6
8	Drought resistant	Ability to cope with low quantities and low quality fodder	6
9	<i>Hej</i>	Indicating mothering qualities of the ewe	6
10	Disease resistance		5
11	Big and healthy lambs		4
12	High growth rate of lamb	Lamb should grow fast after birth, probably also indicating milk quantity and quality of the ewe	3
13	Short parturition interval	Indication high number of lambs during lifetime	2
14	Good characteristics in family members	Earlier generations and family members of ewe should all have good qualities	2
15	Small ears	Indicating preference for the local <i>Boti</i> breed	2
16	Obedience/docile	Easy to handle and manage	2
17	Strong hooves	Indicating walking ability and resistance to foot rot and other problems of the hooves	2
18	Long tail	? (Possibly indicating preference for the <i>Bhagli</i> breed, a relatively high producing breed)	2
19	Dung production	Indicating quality and quantity of dung	2
20	Fast recovery of ewe after lambing		1
21	Short tail	Indicating preference for the local <i>Boti</i> breed	1
22	Easy parturition	No birth complications	1
23	Colour	Personal preference for a colour or colour pattern probably indicating indirectly preference for a certain breed	1

This data was obtained through household and group interviews in which both men and women participated. Six group interviews (averaging 8 people) were conducted. Twelve household interviews were held, typically involving the female and/or male adult of the household, occasionally with another family member joining in.

The Raika do not only diversify within species to cope with ecological conditions and market demands; they also diversify between species in order to spread risks and maximize profit. Keeping mixed herds of goats and sheep offer several advantages. Goats can serve as wet nurses for lambs whose mothers have died and goat meat fetches higher prices than mutton. Goats are more resistant to disease than sheep, survive better on the dry season vegetation of trees and shrubs, and make good leaders for the herd. On the other

hand, sheep have the advantage of producing better quality wool and dung than goats. Sheep can be shorn up to three times per year, while goat hair is only cut once a year. Keeping mixed herds spreads risks, diversifies products and spreads income more evenly throughout the year. In the study area, goats comprise 11%-35% of the herd, which probably maximises the returns. In areas where rainfall is a serious limiting factor for vegetation growth, goats and camels are more popular.

Men and women share the work

Women and men have their own responsibilities and workload when it comes to sheep husbandry. Most women's work and decision making takes place within the house or yard of the household, while men take the sheep for grazing and participate in public meetings that relate to sheep husbandry. Because the contribution made by women is not as visible as the men's, it is often assumed that women do not play a significant part in sheep husbandry, let alone sheep breeding. Gender-based division in labour and decision making varies highly between Raika households. Households exist where women perform all or the majority or all of sheep husbandry related work because men are not available or capable to perform activities relating to sheep husbandry due to illness, alcohol or opium abuse, mental disability, divorce or paid labour.

Women are typically responsible for milking ewes, processing milk products, caring for newborn lambs, collecting dung, cleaning the corral and preparing and giving supplementary fodder and water. Women are often more knowledgeable when it comes to assessing the mothering abilities of ewes and issues relating to milk production, including the persistence and quality of first milk of a potential stud ram lamb's mother. Because they care for newborn lambs they are also very knowledgeable about the character, vitality and health of lambs. Preparing traditional medicines is equally shared by men and women. Typical male tasks include herding, cutting branches for home feeding and applying modern medicines. Cutting wool, administering traditional vaccines to prevent sheep pox, and castration are exclusively men's domain due to socio-religious restrictions. Almost all important decisions are taken jointly between the male and female heads of the household. These decisions include which animals to sell and at what price, disease diagnosis and treatment of sick animals, and ram lamb selection. Women negotiate dung prices with farmers, while men negotiate wool prices.

More than just mutton

Sheep play an important role in social and cultural life. They are offered as dowries, and when a Raika loses a lot of sheep to disease or drought others in his village donate one or more sheep to him for the symbolic amount of 1 Rupee (\$0.02). Sheep are prayed for and play a crucial role in several religious rituals. Before sheep shearing, the Raika perform a ceremony for Laxmi, goddess of money, who they hope will reward them with good wool prices and quality wool. They select some of their



Soni Devi (right) selected this Boti lamb to be her ram lamb because of the Boti sheep's drought resistance and good milk persistence.

best sheep, rams and ewe lambs. These sheep are washed, paint (*tika*) is put on their head, and are given jaggery and coconut while incense is burned. Some sheep are given silver jewellery to wear around their necks. When a lamb is born during the last day of *Poonam* (14th day of each Hindi month when it is full moon) or during *Amawash* (the 30th day of each Hindi month when there is no moon), the lamb is never sold or slaughtered. These *Amar* sheep (male) and *Janri* (female) give status and respect to the owner. The colour black is associated with a local god called "*Kala Bheru*" (black god). Black sheep are rare and are highly valued by Raika, and black wool fetches prices up to five times more than white wool. Wool from the neck and head, which is considered unspoiled and clean, is used to make good luck charms or *dora*. Black sheep are said to protect a herd against death and sickness, and are used in purifying rituals.

What about the future?

For decades the Raika have managed to earn a good income by selling ram lambs, wool and dung. They have been able to cope with harsh climatic conditions because of their knowledge of breeding, migration routes, fodder resources, diseases and healthcare. Their success not only depended on their own efforts, knowledge and skills but also on their good relationship with farmers, forest officers and other governmental employees.

When questioned about bottlenecks related to sheep husbandry, the Raika unanimously cite the shortage of grazing land as a serious threat to their livelihood. The reduction of grazing land has several complex causes. Before the 1970s, The Rajasthan Tenancy Act (1955) and the Allotment of Land for Agricultural Purposes Rules (1970)



safeguarded the interest of the Raika and other livestock keepers by ensuring that certain village lands, such as forests, land around temples, pasture land, and lands covered by water could not be turned into private agricultural land. The Raika are especially dependent on common fodder resources because they own too little land to sustain their animals after harvest. But in the early 1970s, the national government began changing its stance by introducing a new forestry bill that allowed the local village council or *panchayat* to fence off common lands in a village to improve vegetation cover. The village council consists of predominantly upper caste landowning groups that have substantial power over the other (lower caste) members. Decisions taken by the council seldom favour the Raika, since their interests are not shared by other groups. This creates a vicious cycle: being forced into migration because of reduced grazing resources and staying out of the villages for longer periods means that the Raika represent even a less of a force in village politics³.

In addition, Raika society is inherently conservative; it is ruled by elders who are sceptical about change and do not realise the need to adapt to new circumstances and adopt new skills⁴. These elder Raika do not necessarily share or defend the interests of younger Raika pastoralists.

For a long time crop farmers and the Raika were dependent on each other, for the sheep provided the cultivated fields with manure, and in turn the fields provided the sheep with fodder and agricultural by-products. Due to the intensification of agriculture and agricultural policies, more people are switching from traditional rainfed agriculture to irrigated agriculture with the consequence that crops can be grown year round and the fallow period is reduced considerably, resulting in the Raika losing grazing

resources. The human population in Rajasthan is increasing above national average growth rates, and alongside it so is the animal population, especially that of small ruminants. Increases in livestock have overcrowded pastures and other grazing lands, depleting grazing lands and causing soil erosion.

These are but a few of the forces that have been changing the ecological and institutional landscape in Rajasthan. The Raika have not been favoured by any of these changes and are increasingly marginalised. When the Raika are forced to sell their animals there are few alternatives but to take up low paid labour in cities that are already overpopulated. This leads to disrupted families, frustration, alienation and sometimes alcohol abuse and HIV infection. Raika identity is tied to their animals. This distinguishes them from others and gives people a sense of pride, independence and well-being. If the Raika lose their livelihood, valuable breeds and invaluable knowledge will also be lost. As had been pointed out by the League for Pastoral Peoples, "*Local breeds may carry genetic material of immense value. When a breed becomes extinct, the whole world loses some of its ability to react to changing environmental conditions, resist unforeseen diseases, and respond to changes in human dietary preferences. This undermines the food security of the poor – and potentially of us all.*"⁵

Pastoralism provides a livelihood for thousands of Raika families in Rajasthan and Gujarat. They make use of areas that are otherwise unsuitable for crop production. Their sheep and goats' complex digestive systems enable them to convert roughage into products that are in high demand, such as mutton, milk, leather, wool and fertiliser. It is especially important in countries where mainstream policies are not in favour of pastoralism – like India – for likeminded organisations to join forces to convince governments of the importance and advantages of pastoralism. This can be done through regular meetings, symposia or workshops where new insights and research results can be presented. In this way, governments and other organisations concerned will be able to make more well-informed decisions that offer a secure future for the Raika and their animals.

Whether or not the Raika will be able to keep sheep husbandry as a profitable venture will depend as much on their political organisation, unity and ability to clearly articulate their collective interests as on their skills and innovativeness as pastoralists. The goodwill and support of NGOs, government officials, policy makers and international organisations, will be crucial in this respect.

³ Arun Agrawal, "I don't need it, but you can't have it: Politics on the commons". In: *A Collection of Papers from Gujarat and Rajasthan*, Network Paper 36a, Pastoral Development Network, Overseas Development Institute, July 1994.

⁴ Ilse Köhler-Rollefson, "Organic" livestock production: An option for Raika pastoralists? *League for Pastoral Peoples Annual Report*, Ober-Ramstadt, Germany, 2003.

⁵ League for Pastoral Peoples, *Securing Tomorrow's Food: Promoting the sustainable use of farm animal genetic resources*. League for Pastoral Peoples, Ober-Ramstadt, Germany, 2002. www.pastoralpeoples.org



Ellen Geerlings spent several months with the Raika preparing her MSc thesis on 'Raika Sheep Husbandry and Ethnoveterinary Knowledge'. Says Ellen, "I'm grateful to the Raika who provided me with their valuable information and tea, to the League for Pastoral Peoples for their support, to Hanwant Singh Rathore for logistical help, and especially to Ramesh Bhatnagar for his

help, patience, translation and good company". Ellen works closely with the League for Pastoral Peoples (www.pastoralpeoples.com) and can be contacted at ellengeerlings@hotmail.com.

The farmer and researcher may be lost soul mates, but reuniting them may not be an easy task. Having been compartmentalised and isolated for decades, they now speak different languages and have contrasting worldviews. But there is an urgent need to bring the farmer back into the research arena, particularly in the arena of public research, which is running the risk of subjugating itself completely to industry's agenda. Challenging though this will be, the rewards will be many – for consumers, the environment and biodiversity.

Science meets its Soul

The promise of participative breeding

RÉSEAU SEMENCES PAYSANNES

For many decades, farmers and researchers have been isolated from each other as agriculture became more specialised. Today both groups realise the limits of conventional selection in terms of the diversity of varieties and crops being generated, the quality of products grown, and their adaptability to soils and to agricultural systems. As wide as the divide has got between them, many researchers and farmers would welcome the idea of working together in participative breeding. The hyperspecialisation of varieties developed for industrial agriculture is not satisfying farmers or consumers, and their dissenting voices are getting steadily louder. This dysfunction is felt particularly strongly by those employed in independent, small-scale, organic, low-input farming (and 'amateur' growers), or farming practised in difficult terrain or for new markets.

But the concept of participative breeding remains ambiguous and the source of deep controversy, even where it has been put into practice in recent decades. This has been especially the case in countries of the South where participative development was brought in to solve conflicts of post-independence authoritarian initiatives. The term "*participative breeding*" is meaningless on its own; its execution needs to be described to establish whether it has any value.

Does participative breeding encourage real and democratic participation of farmers? At what point in time and in what form is the farmer involved? What is the role of the researcher? Are researchers ready to share control of key decisions in relation to plant selection? How do we ensure that farmers and civil society have better control of the orientation of public research?



Words are not enough

For the last twenty years, numerous experiments in participative breeding have been documented in the South. These testimonies invite us to question what needs to be done in Northern countries where there is a different context for farmer agriculture. How can we integrate the formal improvement of plants and the local selection of seeds so as to maintain biodiversity in the fields and allow democratic control of the first link of the food chain? How can we bring about the necessary changes in institutions, organisations and individuals to promote the emergence of knowledge based on dialogue and collective reflection? Today the opportunities for participation – be they in drawing up policies, formulating projects and rules, setting up implementation exercises or the evaluation process – are restrained by state institutions, by regulations and by professional bodies. At best we have some partial sequences where participation is

“There is a big difference between a carefully crafted space created at the invitation of the authorities and spaces created by civil society where people meet together on their own initiative.”

meaningful, but rarely are these processes allowed to extend from one end of the research chain to the other.

The nature and origin of spaces for participation must be questioned when assessing how meaningful it is. There is a big difference between a carefully crafted space created at the invitation of the authorities to probe public opinion or legitimise its policies, and spaces created by civil society where people come together on their own initiative, in solidarity and mutual concern. Taking participation seriously also means taking it to a new level and institutionalising it. Extending methods established in micro-initiatives (project/local) to the macro level (policies/national) means questioning long-held practices and retraining, which are major challenges for the individuals and organisations involved.

Breaking down the walls to participation

It is not possible to take an interest in participative breeding without broadening our interest to the larger agricultural development model. Researchers have a fairly narrow perspective on what participative breeding means; the farmer's reality is more global. ‘Something that nourishes us is beauty, beauty in our fields’, says a farmer. Will researchers be able to incorporate this perspective into their research strategy? Could subscription to a common goal be a final objective? A goal that takes account of the product's destination, the perspectives of all the actors (without enslaving any of them), and the sustainability of the

agricultural system. Producing wheat to make bread to feed people requires engaging with the farmer, the miller, the baker, consumers and health professionals ...approaching the field as a whole. Participative breeding must put all these people around the same table. To undo the fragmentation of knowledge, we need to create a new space.

When considering plant selection, terms like ‘improvement’ and ‘partnership’ are very subjective. Goals are equally subjective. What we improve relates to the goal that has been set – does that make other goals any less worthy? For example, when deciding how to deal with a predatory insect requires a global approach to the ecosystem that should call on many different actors. Do we need to eradicate a pest causing a problem or should we change the ecological niche it occupies? If we are examining allergies to gluten, we need to ask: Is the allergy the result of selection? Is it caused by standardising the transformation process of the wheat? Is leavening the cause of allergies? To answer these questions it is necessary to bring together the work of the plant breeder, the farmer, the miller, the baker, the doctor, the psychologist, and the sociologist. The relationship between the ground, the plants and their natural and human environment is essential. It is also necessary to allow the researcher and the farmer, conditioned by centuries of reductionism, to take part in an exercise without dividing walls.

Changing roles and unlearning behaviour

For two centuries, we have settled into a division of labour wherein researchers research, plant breeders select and ‘untrained’ farmers merely apply or consume the results of this research. If a question arises, the ‘experts’ are called on to answer. Participative breeding requires a change in attitude in which each understands a share of reality that the other one does not know, each has his own abilities, his own vision of the world, which is recognised by one and all, and there is no hierarchy in knowledge levels between scientists and farmers. The researcher rejects his omniscient status and becomes the moderator, revealing the knowledge and know-how of the farmers, while at the same time proposing a methodology. Each accepts that his own knowledge be questioned, modified and shaped by the knowledge of the other.

To get to this point, big hurdles need to be removed. We live in a world where science continues to progress by questioning its own past certainties, yet is presented as the sole, unique and absolute truth, while in parallel the image of the farmer, his knowledge and his know-how have been



degraded. Today's researcher, even the most open and motivated, comes from a background where the stability of social hierarchies is measured by the durability of its dogmas, and of an educational system which has imprinted a very Cartesian vision of the world. When approaching this new concept of his own role within research, he must learn to put into question a large part of his benefits and social status. For his part the farmer must also make an effort to escape from his role of a simple, untrained novice. His knowledge is certainly different from that of the researcher, but it has as much value. Only if both parties recognise this can the collaboration be more than a dialogue of the deaf.

Square pegs into round holes

For the last two centuries, selection has replaced variety and diversity with uniformity. The approach to selection demanded by the seed industry follows the logic of cloning and the logic of expropriation. The plant breeders have applied industrial standards to living things, making them more predictable, measurable and ownable. The market, contrary to the culture of exchange, cannot bear goods that are not "identified". A population of plants resulting from farmer selection, cultivated in conditions that are not homogenised by fertilisers and pesticides, is heterogeneous and unstable. These plants cannot, by definition, be identified by the industrially-oriented criteria of Distinctiveness, Uniformity and Stability (DUS)¹ that have pervaded the selection process, nor can they be protected by intellectual property rights (IPR). Because of this, so the thinking goes, they must be eradicated. This is not the case for a pure line, a hybrid or a clone. We can think of these as a sort of "living-dead", varieties made into objects by their stability and homogeneity, and which can be protected by a Plant Variety Protection (PVP) certificate² or a patent. 'Stability' is a very subjective term, of course. Genetically modified organisms (GMOs) represent the pinnacle of this logic, to the extent that their extreme genetic instability is completely ignored in their stability assessment.

Seeds developed and selected by farmers are not made for industry, but for farmers. Instead of asking to what extent these seeds can adapt themselves to industry, we should be looking to industry to adapt itself to the diversity of the living, even if this means changing the scale of operations. For example, gluten allergies are a public health problem because the modern wheat used in bread is selected for its ease of industrial processing, rather than what consumers might want. Many organic farmers cultivate wheat which is deemed

by industrial breadmakers to be 'unsuitable for making bread'. So they make the bread themselves, or have small organic bakers bake it, and have no problems at all with their 'unsuitable' wheat, so long as they use more traditional methods. Farmers' seeds go hand in glove with a change in language and a relocation of the economy.

The products of participative breeding – farmers' seeds – are illegal today thanks to industry-oriented regulations that public research has helped put in place. Public research controls the criteria for DUS that farmers' seeds cannot conform with, it sets the official catalogue that farmers cannot afford to register their seeds with, and it collects biotechnological patents and multiplies its agreements and contracts with private companies which seek to stamp out farmers' seeds.

The damaging impact of the official catalogue is clearly illustrated by a current concern. If the catalogue is applied to Eastern Europe now that these countries have joined the European Union, there will be a dramatic loss of biodiversity and cultural heritage, since most of the varieties presently used there are extremely diversified, and would not have access to the catalogue. How can we keep these varieties alive if all exchange is forbidden? How can we prevent private companies from appropriating them? A new system of description, based on different criteria from DUS must be developed. More freedom must be allowed for exchanges of heterogeneous and non-standard varieties, while at the same time they must be protected from piracy by private interests.

The realm of IPR is a particular challenge to the quest for participative breeding. Who owns the products of participative breeding: the research establishment, farmers, or the 'public' who finances 'public' research? What are the mechanisms for ensuring exchange and experimentation are possible without opening doors to piracy? Questions concerning IPR must be settled before and not after the realisation of projects. To defer these critical questions until later will generate inevitable conflicts.

Participation is not a pipe dream

Despite the many challenges presented by participative research, credible approaches to participation keep multiplying all over the world, in the shape of citizen's juries, consensus conferences, and so on. In France today traditional

"Instead of asking to what extent these seeds can adapt themselves to industry, we should be looking to industry to adapt itself to the diversity of the living"



¹ The DUS criteria are requirements a variety must meet for a breeder to be awarded monopoly control over a variety under a PVP regime (see below).

² PVP is a strong, patent-like form of IPR developed specifically for plants under the International Convention for the Protection of New Varieties of Plants (UPOV Convention), which now has 55 member countries.

seed propagators have set up knowledge exchange circles on seed selection and propagation with groups of farmers. One positive outcome of these meetings is rediscovering the families of kitchen garden vegetables. Market gardeners and farmer-plant breeders in Germany and Switzerland are also working together to share their methods and create varieties. Biodynamic farmers are often pioneers in these fields. To move ahead, there are four key areas we can focus on addressing:

1) Resituating the researcher and the farmer

There is a problem of language that recurs in the course of debate on participative breeding. The farmers question the definition of 'researcher'. Since they experiment daily in their fields, are they not researchers? If the term 'researcher' is reserved for scientists remunerated by institutions and who have this as their unique role, then the pertinence of this researcher to farmer selection is in turn questioned. Research must be done in the field of the farmer, where the farmer notices and takes account of the existence of 'scientific aberrations' and inconsistencies. But farmer-researchers also admit that they too can learn from the researcher's

"Successful examples of participative breeding show that success is directly related to the quality and the transparency of the organisation and how participation is moderated."

skill and knowledge – perhaps to gain an understanding of the genetic background to the selection process, or to take advantage of the facilitated access seed banks the researcher might have, or to learn about different methodological approaches.

In resituating the farmer and researcher, we must also consider who moderates the show. Should it be the farmer, the researcher or a third party? Successful examples of participative breeding show that success is directly related to the quality and the transparency of the organisation and how participation is moderated.

2) Bringing skills together

We can start by bringing skills together, but the problem in research is that everything is partitioned, with different vocabularies used in different sectors. Laboratory researchers and field researchers have a hard time communicating with each other, so it is even harder for them to communicate with farmers with their global approach and hands-on knowledge.

Bringing skills together brings us back to the importance of a cross-disciplinary approach. Organic farmers seeking out varieties which can compete with weeds could use the assistance of an ethnobotanist to understand how and why the

weeds are there. If entomologists and historians worked together on phylloxera, perhaps they could find out why it does not present nearly the problem it did a century ago³. Developing interdisciplinary programmes means putting together adapted methodologies and vocabularies (e.g., defining 'selection', 'conservation' or 'propagation'), agreeing on quality standards (e.g., for bread making), setting up traceability methods for seeds that are cultivated on farms, and so on. In the absence of an official researcher, an independent plant breeder can also offer his services to local agricultural authorities on participative breeding.

3) Establishing codes of conduct

Codes of conduct help to avoid abuses by researchers resulting from the hierarchy of knowledge and the balance of power in existing vertical structures. Many such codes of conduct have been drawn up by farming communities around the world to this end. Interesting partnerships often spring up between researchers and farmers, but farmers may still engage in research alone, either because the code of conduct is not adhered to by researchers, because no researcher is willing to take on the work, or because the farmer chooses it that way. Other limits to participative research may also present themselves. Some species will likely be long time 'orphans' of participative research because regulations and techniques have established such a stranglehold that competition with the big seed companies is virtually impossible. In France, grapes, maize and non-hybrid vegetables come into this category. In the South, crops like millet, sorghum and quinoa are likely to be orphaned too, but for different reasons. Farmers are not solvent enough to finance research – however important – and nor is the public sector.

4) Revamping or replacing research institutions


To establish new relationships and switch from vertical to horizontal exchanges between knowledge pools, we need to consider the de-institutionalisation of agronomic research. Some progress can and is being made to transform institutional thinking and practice, but it may not be enough. In 2000, after a lot of lobbying, a committee on organics was set up at the French national research institute, INRA. Participative breeding is finally recognised as a tool of work within the department of plant improvement, but it is restricted to only one crop, durum wheat, and is tied to the needs of industry. Small gains like this are often more than counterbalanced by shifts in the opposite direction. Like many other public research institutions, INRA does not encourage participative research; it prefers to be at



³ Phylloxera is an aphid-like insect native to the eastern and southern U.S. The pest was inadvertently introduced to France from North America in 1860. By the end of the nineteenth century phylloxera had destroyed two-thirds of the vineyards on the European continent.

the competitive edge of the race for GMOs and IPR. After two years of consultation INRA finally decided to drop 65 of the 70 species on which it had been working on for varietal development, retaining a mere five species: wheat, organic durum wheat, grapes, pea, and rapeseed.

Civil society groups addressing issues related to food production – environmental impact, self-sufficiency, quality and mode of distribution and so on – are largely unaware that public research is abandoning the public. Many researchers are not happy with this shift, and there is very little time left to take advantage of the wavering and hesitation at INRA and other public research institutions. Common platforms of farmers, researchers and civil society must be launched to propose other points of view, changes in the methods of work (such as a code of conduct charter), and so on. These platforms must be concretely rooted in experimentation, and in safeguarding and nurturing biodiversity in

farmers' fields. It may prove necessary to get rid of institutions like INRA, to save them from the magnet of corporate money. Civil society can mobilise on this issue, just as it has over GMOs, food quality and food culture, and it can also contribute to financing these platforms. But it will only do so if it is informed of what is at stake. To move forward, we must communicate and act in all circles, as widely as possible. 

This article was translated and adapted from a paper entitled "La Selection Participative et la reserche publique en France" which was drawn up at a workshop organised by the Réseau Semences Paysanne at the Ferme du Moulon, INRA, Gif sur Yvette, France, on May 6, 2004. The paper highlights the important points in the debates and does not necessarily reflect the position of all the participants and guests to this workshop. The whole report of the workshop (in French) can be obtained from the secretariat of the Réseau Semences Paysannes (Peasant Seed Network): semencepaysanne@wanadoo.fr



Ibrahim Ouédraogo

GRAIN: What are the conditions like for small farmers in Africa and what are the main challenges that they face?

Ouédraogo: Most small farmers in Africa live in extreme poverty, where they face a constant struggle to survive. The challenge for them is to assure that their farms can provide food for their own families and, if possible, a surplus or a cash crop that they can sell in the markets to cover the costs of healthcare, school fees for their children, and so on. Faced with this situation, farmers seek to organise unions and associations that are strong enough to defend their interests. The farmers' unions organise technical training programmes, form co-operatives, develop markets for local produce, and

set up village banks, which allow farmers to escape local usurers who often charge interest rates reaching 100%. But the life for the African farmer remains a daily struggle, complicated by drought and erratic rainfall. These small farmers are the focus of INADES-Formation's work. We try to help them make their voices heard and to help them find sustainable solutions to their problems.

Do you think GM crops can help resolve the problems that African farmers face?

African farmers have developed their own seeds that are adapted to their agricultural systems. They've developed water harvesting techniques, methods for enhancing soil fertility and pest management practices that are highly effective and that enable them to survive in unpredictable and precarious environments. There is a lot of publicity and money spent promoting genetically modified (GM) crops, but we must be cautious. The information we have from South Africa and India does not show significant yield increases, and there are many potential risks.

I think scientists here understand that there are many techniques already developed here that are more appropriate and important for African farmers, such as those dealing with soil fertility and water management. For example, if you go to the Sahelian (desert) parts of Burkina Faso, you'll see that farmers have developed water harvesting techniques that allow them to farm under conditions of drought – and produce enough vegetables to feed the markets in the cities. These are the kinds of techniques that need to be supported. With GM crops there are major economic risks. Small farmers could easily lose their autonomy.

Is the contamination of local seeds by GM crops a current concern?

Burkina Faso has already carried out field experiments with GM cotton and other countries will soon follow. But small farmers and the public have not been informed about the experiments, even though they put people at risk. In West Africa, cottonseed is used as food for humans and livestock, and cross-pollination is also a concern. There needs to be strong regulation and far greater transparency. The tests that are currently being carried out are not open to the public and, consequently, the results can always be manipulated to hide any failures and make it seem as if these crops are the solution for African agriculture.



Ibrahim Ouédraogo ...

is Secretary-General of INADES-Formation, which brings together the African Institute for Economic and Social Development and the African Training Centre. It is a pan-African association of national organisations with commonly held objectives, strategies and financial resources working primarily with rural communities in ten countries of West, Central and East Africa. Says Ouédraogo, "INADES does not arrive in rural communities with a pre-determined programme. What interests us is supporting the visions that communities have

for their own societies, and we offer them assistance, particularly for issues like food security, management of natural resources, rural credit, and agricultural markets and for the more vulnerable sectors of the population, notably women and youth".

What is INADES doing to help inform people about GM crops?

We have helped to put in place a coalition for the promotion of Africa's genetic heritage (Coalition pour la promotion du génétique africaine) and the African Union has put forward two model laws dealing with biosafety and farmers' rights. I think by drawing attention to farmers' rights we can show that, over the long-term, GM crops and the push for patents will lead to the dispossession of the seeds that African farmers have developed over generations.

We're doing awareness building and training work. We've held meetings with elected officials and civil society to inform them of the risks of genetically modified organisms (GMOs). We're currently working on a strategy to bring the information to the village level, to small farmers, so that they can take positions and make their voices heard.

We're up against a strong lobby for GM crops, which speaks directly to the Heads of State and the Ministers of Agriculture. This is not an easy struggle, but we believe it is a just one, in that we are interested in preserving the heritage that we have, which has allowed Africa to live and produce for generations. It is unacceptable to put this at risk for GMOs that can have all kinds of negative consequences.

In June 2004 there was an event in Burkina Faso organised by US Agency for International Development to promote GM agriculture which brought together many heads of state and high-level officials from West Africa. Why is there this interest in bringing GM crops to West Africa?

Part of the problem is that the national agricultural research programmes are looking to outside sources of funding. The large biotech corporations are eager to support research into genetic engineering, and this has the effect of pushing national research in this direction. And there are also efforts to push African governments into supporting GM crops, like the meeting in Burkina Faso. The objective of the three-day meeting was to push the governments of the region towards accepting biotechnology and allowing GM crops to penetrate the African market.

We organised a parallel event to provide another perspective. We presented our position to all of the national delegations at the meeting and to the press, and we held a public event at the university that brought together over 1000 people,



Building a stone 'diguette' (foreground) around the millet field is a common technique used by farmers in West Africa to combat soil erosion.

with many delegates from rural NGOs, farmers organisations and village associations from the interior of the country. I think our message was understood and we could see that the people were clearly not convinced of the benefits of GMOs. But there is still a lot of work to be done. Civil society groups in Burkina Faso have united behind a plan of action and advocacy to inform people about the issues through workshops and seminars and through the local media. The idea is to build a critical mass within the population that can put forward a responsible and knowledgeable position on GMOs.

Prior to the ministerial meeting, in April 2004, the NGOs ACCORD, INADES-Formation and GRAIN organised a workshop with elected officials in Burkina Faso to explain our concerns over GMOs and to point out the advantages there are for African countries to apply the model laws of the African Union. This was followed by a similar conference with civil society organisations and a press conference. Immediately after the conference, the US Embassy reacted, saying that they wanted me to meet with them to explain why we had taken a position contradicting the state's position on GMOs. They were concerned because the Ministerial conference was set to take place in a couple of months and they were concerned about anti-GMO elements mobilising around it.





Small farmers in Africa could easily lose their autonomy by accepting and adopting GM crops

It appears that USAID will be organising a follow-up conference to the Burkina Faso meeting, this time in Mali in 2005. Will groups in Mali make similar efforts to counter the GM propaganda coming out of that conference?

The coalition in Mali is even better prepared than was the coalition in Burkina for the upcoming conference. ACCORD, which is active in Mali, is an active member of the Coalition, has already organised workshops and conferences on GMOs. They've contacted party leaders and government officials with the Ministry of Agriculture.

The Coalition helped draft an open letter to the UN Food and Agriculture Organisation (FAO) signed by over 650 civil society organisations denouncing the FAO's pro-biotech stance in its 2004 annual report. Can you tell us what this report means from the standpoint of small farmers in Africa?

This letter was really a petition sent to the FAO in reaction to its report, which indirectly and overtly supported GM crops for developing countries. But there is no proof that these GM crops are suited to African conditions; there are no reliable results. And there are major risks: contamination of local crops, economic control over African agriculture by foreign firms, etc. We were disappointed by the report and, as Africans, we had to react. I think the letter was helpful. It showed clearly that there is an alternative perspective that is widely held and that the FAO must engage in greater dialogue before coming to any decision to support GM agriculture.

Is there any message you have for Seedling readers outside Africa?

We are doing what we can with the small political space that civil society now has to operate. We are standing up to these unilateral efforts to impose GM crops on our countries as the ultimate solution for African agriculture. Africans have to organise among themselves, but we also need to work in networks with international partners. There is a lot that we can learn from the experience in other countries. The forces we are up against have the means and the capacity to rapidly impose their agendas. To stand up to this we need international solidarity. The solidarity we had with the meeting in Burkina was very helpful and we hope that this will also be the case in Mali. 2



What's new at GRAIN?

www.bilaterals.org

GRAIN has teamed up with a number of other organisations to launch [bilaterals.org](http://www.bilaterals.org). This new website is a collective effort to share information and stimulate cooperation against bilateral trade and investment agreements that are opening countries to the deepest forms of penetration by transnational corporations. These agreements – “bilaterals”, for short – are negotiated in secret, far from the reach of parliaments or people. They have tended to attract far less attention than World Trade Organisation (WTO) negotiations – and yet their provisions often go even further than existing trade liberalisation commitments made at the WTO. This website was initiated by several organisations and activists who felt the need for an open space on the Internet to share information and action ideas about bilateral deal-making. Any organisations, networks or individuals active on these issues or wanting to get more involved are encouraged to participate.



Bilateral Investment Agreements: Agents of new global standards for the protection of intellectual property rights?

Developing countries have entered into a large number of bilateral investment treaties as well as free trade agreements that include explicit obligations for the protection of intellectual property rights as “investments”. These agreements fall outside the arena of multilateral standard-setting on intellectual property rights, and are being strategically pushed by developed countries to advance their industries' economic interests. This study examines whether and how bilateral and regional investment instruments increase the scope and availability of intellectual property right (IPR) protection beyond current standards, reduce flexibilities available to developing countries under international treaties and can be used to expand the application in their territories of IPRs over biodiversity. The report was written by Carlos Correa of the University of Buenos Aires in Argentina. See www.grain.org/briefings/?id=186

The Disease of the Day - Acute Treatyitis: The myths and consequences of free trade agreements with the US

Bilateral free trade agreements set even more drastic conditions of economic and political subordination than we have known before. They represent an offensive that has the objective of redefining the world – and social relations within it – in order to maximise profits and increase control for the US. These agreements are supra-constitutional statutes that grant privileges and guarantees to big capital from the US and drastically restrict civil liberties, human rights and the sovereignty of peoples and nations. This briefing outlines some of the myths about free trade agreements and spells out the texts that are being imposed by the US, the nation that is pursuing the most aggressive bilateral strategy. Go to www.grain.org/briefings/?id=183

Open letter to the UN Food and Agricultural Organisation

The FAO report (*“Agricultural biotechnology: meeting the needs of the poor?”*) was publicly presented on the 17th of May, and in the space of a few weeks more than 650 civil society organisations and 800 individuals from more than 80 countries have drafted and signed an open letter, co-ordinated by GRAIN, which strongly condemns its bias against the poor, against the environment and against food production in general. Amongst the signatories are many peasant and indigenous peoples organisations, social movements and scientists, as well as NGOs. Before the open letter had been handed over to the FAO on the 16th of June, the FAO had posted a reaction on its website, arguing that in reality FAO's position was much more balanced than argued in the open letter. FAO's reaction did not address the substantial issues raised in the open letter, but the letter provoked a interesting debate within the FAO at different levels - a discussion which still continues within the agency today. Go to www.grain.org/front/?id=24

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