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FARMING MATTERS

Small-scale agriculture for a sustainable society

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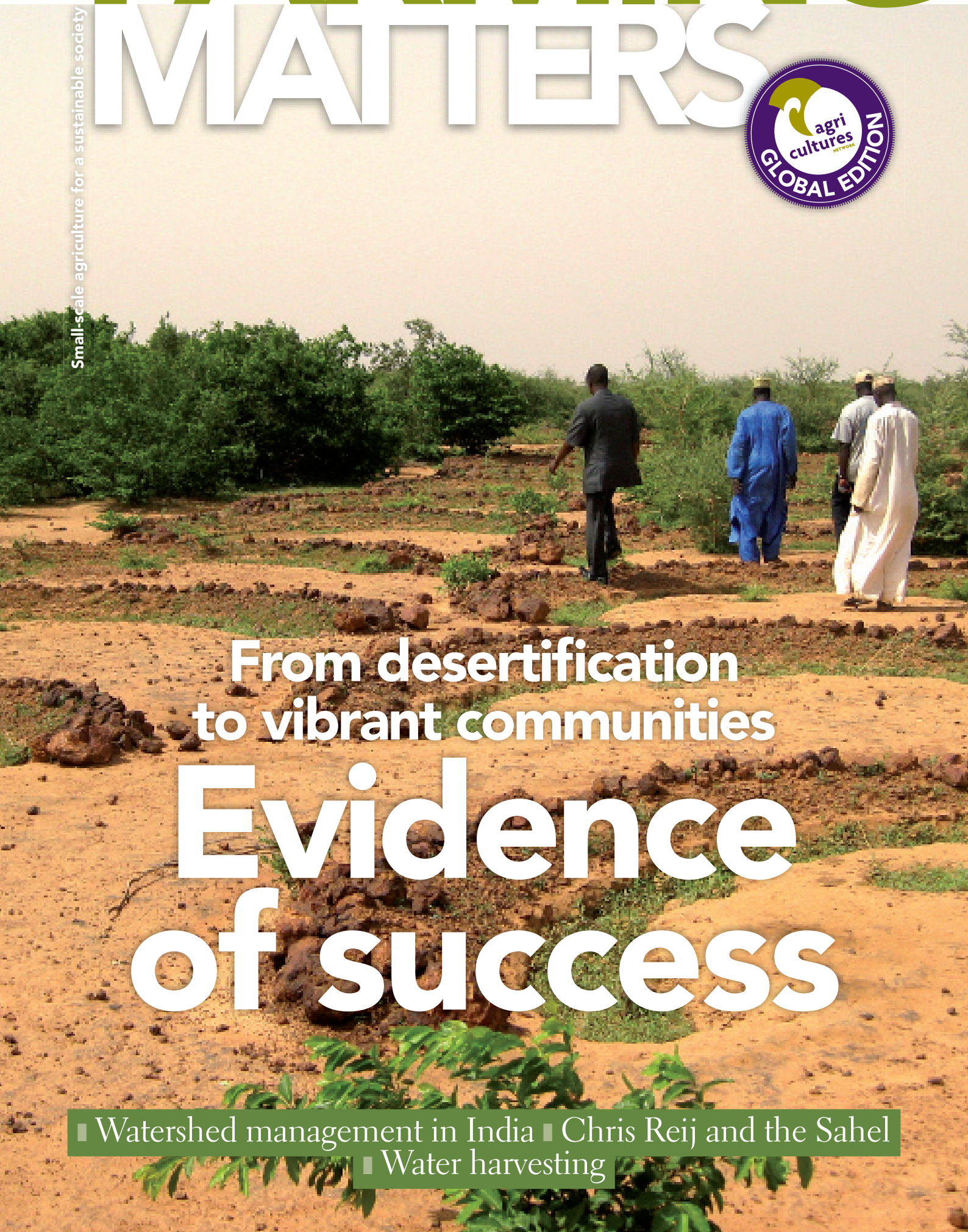

From desertification to vibrant communities

Evidence of success

Watershed management in India ▮ Chris Reij and the Sahel ▮ Water harvesting

CALL FOR ARTICLES

Emerging markets

Almost all small farms produce both for self-consumption and for the market. Successful participation in the market not only depends on factors such as the organisational capacity or the existing infrastructure, but also on how farmers can take advantage of the existing value chains and on how they strike a balance between the monetary and non-monetary economies. Many programmes for rural development focus on developing the value chains that link producers to consumers. Most of them assume that, by connecting farmers to people who can buy, process, package, and market their produce, farmers will increase their incomes. However, increasing the efficiency of value chains does not automatically benefit family farmers, particularly in the face of globalisation or price volatility, so the issue of how farmers can increase their share of the value added, or receive a fair portion of the final price, is often not addressed.

Issue 29.2 of *Farming Matters* will look at recent innovations in value chains and emerging agricultural markets. It will look at the ways in which farmers can become more resilient in the face of price fluctuations, climate change, or hostile institutions. What strategies do farmers and their organisations employ to meet the challenges posed by the corporate domination of agricultural markets? This issue will examine the policies and institutional frameworks needed to make value systems work for poor farmers, and how the development of "new economies", local markets and local value chains can improve rural livelihoods in a sustainable way. This also implies strengthening the autonomy of family farmers and enhancing multifunctionality on agro-ecological farms.

Send us your contributions! Please visit our website and make suggestions, comments or ideas for this issue. Articles for the June 2013 issue of *Farming Matters* should be sent to Jorge Chavez-Tafur, editor, before March 1st, 2013 E-mail: j.chavez-tafur@ileia.org

Retiring to dairy farming

Most of those who stop working after having had a job for several decades see their incomes decline drastically. In Mapepe, close to Zambia's capital, former senior civil servants have transformed their lives by becoming dairy farmers and organising themselves in the Mapepe Dairy Co-operative. One of them is Colonel Cosmas Mazuba, who became the co-operative's Chairman after retiring from the army. The co-operative offers members technical support (such as training in animal production) and sells their milk collectively to the Dairy King milk company. Moreover, several financial institutions, including the Micro Bankers Trust, offer small loans to co-op members to improve their production system. Impressively, the co-operative has a 100% loan repayment rate. The secret to this success is that their approach is based on trust and personal connections. When Dairy King pays the co-operative for the members' milk, the monthly loan repayment is deducted from the farmer's share. If a member has trouble repaying, the co-operative ensures that financial institutions receive their repayments on time. Through such methods, the co-operative has become a trustworthy partner, making it easier for co-operative members to access new loans. This mixture has helped some members triple their incomes since joining the co-operative. The availability of financial and technical services not only contributes to improving the livelihoods of these farmers in Mapepe but, as more quality milk becomes available, also benefits the entire community.

Text: Linda Moono
Photo: Laura Eggens

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AND MORE

In memoriam: Anita Ingevall

On November 24th 2012 we received the sad news that Anita Ingevall has passed away after a long battle with cancer. Anita was ILEIA's director from 2000 till 2006. She helped ILEIA through a very challenging period and put the organisation firmly on its feet. She was also the founding mother of the AgriCultures Network. We all remember her as a person who was very dedicated to the cause of small-scale farmers and the environment, and wish her friends and family strength and courage.

Dryland farming matters

Sustainable agriculture in dry and degraded areas is about the resilience of farmers and ecosystems. Increasing the soil's organic matter content is the most essential thing that dryland farmers can do to increase the stability of their farm. Organic matter contains nutrients and offers a space for the temporary storage of applied fertilizers, it absorbs and releases water, supports soil life and soil biodiversity, increases water infiltration and protects against erosion.

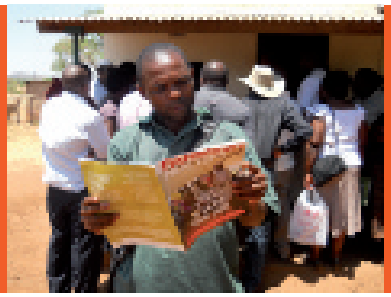
Over the years, soils have lost a considerable part of their organic matter content. Agricultural policies heavily promoted the application of chemical fertilizers while neglecting the importance of organic matter, as elaborated in the theme overview of this issue of *Farming Matters*. As a result, many farmers have chosen to apply nitrogen fertilizers in search of high yields and, at the same time, they have reduced the application of organic matter. This is a fundamental mistake: after a number of years, their yields decline as the organic content of the soil drops. Water soluble nitrogen is washed out every time it rains, and micronutrient deficiencies and drought damage become apparent. This is happening on a very large scale in dryland areas. Farmers experience more drought today than they did thirty years ago, largely because the organic matter content in their soils has gone down, sometimes dramatically. The absence of organic matter in the soil multiplies the effects of climate change.

There are some basic metrics of dryland farming that everyone involved in dryland development should know. Each year of cultivation without the application of organic matter and with the removal of crop residues and stubbles reduces the organic matter content by about 5 to 10 tons per hectare. If a farm family increases the soil organic matter content by 1%, they create additional storage for 160,000 litres of water per hectare.

Let us think through the consequences of this. Dryland soils badly need more organic matter, so dryland farmers need to develop smart methods to increase the biomass on their farms. At the same time, policy makers need to understand these simple facts and get their priorities right.

Edith van Walsum, director ILEIA

Farming Matters welcomes comments, ideas and suggestions from its readers. Please contact us via e-mail at ileia@ileia.org or write to P.O Box 90, 6700 AB Wageningen, the Netherlands.



Farmer organisations

The successes of the co-ordinated actions of farmer organisations are overwhelming – issue 28.3 of *Farming Matters* attests to that. However, I wonder if national governments provide enough institutional and political space for farmer organisations. In Uganda, for example, politicians have shown very little interest in farmer organisations since the mid-1980s, focusing only on marketing and financial co-operatives. Strong grassroots organisations and mobilisation processes pose a formidable political risk for most governments; it is therefore not surprising that many organisations of small scale farmers have remained weak. Market co-operatives often only fit with well-to-do farmers; I don't really think that the success of marketing co-operatives really means that farmers are empowered. In most cases these co-operatives keep small-scale farmers in the background, forced to work under oppressive market relationships.

Sean A. Patrick, Ugandan activist and campaigner for peasant movements and institutional indigenous knowledge integration

Village chickens for the market

I appreciate the effort of this magazine in sharing developments that take place in the agriculture sector worldwide. The farmers in Nyachilenda (Malawi) now use the knowledge and experience I got from an article in the *LEISA magazine* of December 2006. Using ideas from the magazine I presented a proposal to the US Ambassador's Self-Help Funds on HIV, which funded a CBO with US$ 3,900 to buy 750 indigenous chickens for 250 beneficiaries. The project aimed at creating awareness about HIV, while enhancing the CBO's capacity to care for HIV orphans. The beneficiaries were asked to contribute at least a chicken each on a quarterly basis to the CBO while maintaining the breeding flock. The CBO uses the profit from the sales to pay for orphans' school fees, school uniforms, writing materials, etc. In addition, the chickens increased the farmers' income, and provide high quality protein from eggs and meat, as well as high quality manure. Bravo to LEISA/ *Farming Matters* for sharing with us what is happening globally.

Whytone S. Fole, Agriculture Extension, Nsanje District Agriculture Development Office, Malawi

Insightful interview

The interview with Cornelia Butler Flora on your website is insightful. She is sceptical about large-scale policies. While I agree that policies supporting agro-ecological approaches to agriculture may be useless in the current political climate, I would contend that groups and individuals must still be vigilant in holding back the entitlement mindset of big agriculture.

Jim French, in a reaction to the interview published on www.agriculturesnetwork.org

University readers

For a long time, every three months, the post office of the Institute of Agriculture and Animal Science of Tribhuvan University has received more than 100 copies of *Farming Matters* for students and teachers. Reading this magazine is very fruitful and enhances our knowledge; it helps us to connect recent news and issues around the world. We are very grateful to ILEIA for providing these magazines. Day by day, the readership of your magazine at our institute increases because it matches our courses on agriculture so well.

Dinesh Panday, student, Rampur, Chitwan, Nepal

Land rights

All the lands in the Chittagong Hill Tracts belong to the local government. As the farmers are not owners of the land they practice only temporary "jhum" or shifting cultivation systems, and never set up a permanent orchard, although tree fruits and spices are the most profitable and suitable crops in this area. Neither the local government nor their local leaders give any assurance for long term development. At present, the government is trying to encourage the local farmers to cultivate fruit trees, but no initiatives are taken to ensure their land rights. The hope is that many of the hill peoples are now gaining knowledge and awareness about their rights. The government will need to pay much more attention to improving their livelihoods.

Shailendra Nath Mozumder, Bangladesh

Strengthening the resilience of dryland communities: Towards a new paradigm

Desertification and land degradation are not just natural phenomena. They are the outcomes of long-term over-exploitation and mismanagement of fragile ecosystems. To address these problems, we cannot pursue the same ways of thinking that have led to this situation. We need to take a different perspective - one which is already presenting itself.

AgriCultures Network and Groundswell International

In February 2013, the United Nations will organise a major conference on desertification, sustainable land management and resilience. This is now more relevant than ever. The UN itself estimates that 1.5 billion people around the world are directly affected by land degradation, while every year 12 million hectares of land become unproductive through desertification. The effects are worsened by climate change. Pastures are scorched, crops and livestock often do not survive.

The impact can be devastating. For example, impoverished dryland communities in the Sahel and the Horn of Africa are experiencing high levels of chronic malnutrition, hunger, child mortality and migration, in an environment that is at risk of being degraded beyond repair. Humanitarian aid to cope with each new crisis costs over a billion dollars each time, and leaves many new problems in its wake.

Land degradation is not just the result of natural disasters. It is also the outcome of long-term over exploitation of natural resources and ecosystems, generated by the dominating approach to agricultural development. However, promising initiatives demonstrate that a new paradigm is emerging.

The old model

The dominant model of agricultural development leads to conflict and controversy. Policies and practices continue to be biased towards export oriented, commercial production in areas that have access to more reliable rainfall, inputs, roads and markets. But tens of millions of small-scale farmers who live in fragile drought prone areas cannot afford industrial inputs, such as hybrid or genetically engineered seeds, chemical fertilizers, pesticides, or irrigation.

The current neo-liberal development paradigm, focused on rapid growth, does not see investment in ecologically fragile, drought prone areas as being economically feasible. It foresees (and often drives) many small-scale farmers and pastoralist communities living in such areas to leave and work in towns and cities or large scale commercial plantations or farms. Food aid is dispensed during periodic droughts and shocks while this "inevitable" transition goes on.

A variety of experiences of farmers, NGOs and scientists over past decades has laid the basis for a new agricultural paradigm. A small selection of these experiences is presented in this issue of *Farming Matters*. A central concept in this new paradigm is the *resilience* of farming communities and their ecosystems. This concept has two aspects: ecological resilience, coping with drought and climate change, and socio-political resilience, the ability of farmers to develop their skills and voices to choose their own development path.

The path forward

In this new paradigm, farming systems are seen as a whole, with healthy, active

soils at the basis. The aim of this paradigm is not just increased productivity, but also resilience to climate change and sustaining the natural resource base. For all three aims, it is essential to increase the organic matter in the soil. This improves water retention and fertility, and prevents erosion. Agro-ecological practices range from recycling nutrients and energy, integrating crops and livestock, using low external inputs and diversifying crops. In an agro-ecological approach, these practices go hand in hand with the empowerment of small-scale farmers, both men and women. As farmers gain greater control over their lives, they decrease the risk of crop failure or livestock deaths due to drought and degradation. Farmers reap multiple benefits at once: increased productivity and food security, higher incomes, adaptation to a changing climate, regeneration of their natural resource base and more autonomy.

Many civil society organisations have worked closely with local communities and interested scientists, to develop and document holistic approaches to dryland management. These approaches are powerful because the technical, social and governance dimensions are closely integrated.

Day by day, these experiences are accumulating. Some initiatives have already been massively scaled up as can be seen in the Sahel (see page 14). Other successful examples include the experiences of community groups for watershed development in Indian dryland regions and in the Peruvian Andes (see pages 18 and 34). Such experiences demonstrate that agro-ecological farming is an appropriate and cost-effective approach to increase resilience in drought prone, ecologically fragile areas. There is abundant evidence to support this. Yet, there are challenges preventing a more comprehensive upscaling of this approach.

Change is in the air

Governments and donors still have a long way to go in mainstreaming the agro-ecological paradigm. This involves enabling small-scale farmers to develop their skills, expertise and voice, while supporting their use of agro-ecological farming practices. It requires a truly integrated perspective on dryland management, breaking down institutional barriers and improving collaboration between stakeholders.

Building agro-ecological resilience requires a fundamental change in agricultural investment patterns. For example, the UNCCD argues that it is important to build production systems based on the intensification of locally available and adapted biodiversity, using local knowledge, while its finance mechanism explicitly encourages a large role for the private sector. We would strongly suggest the UNCCD to prioritise investments in strengthening small-scale farmers' capacities.

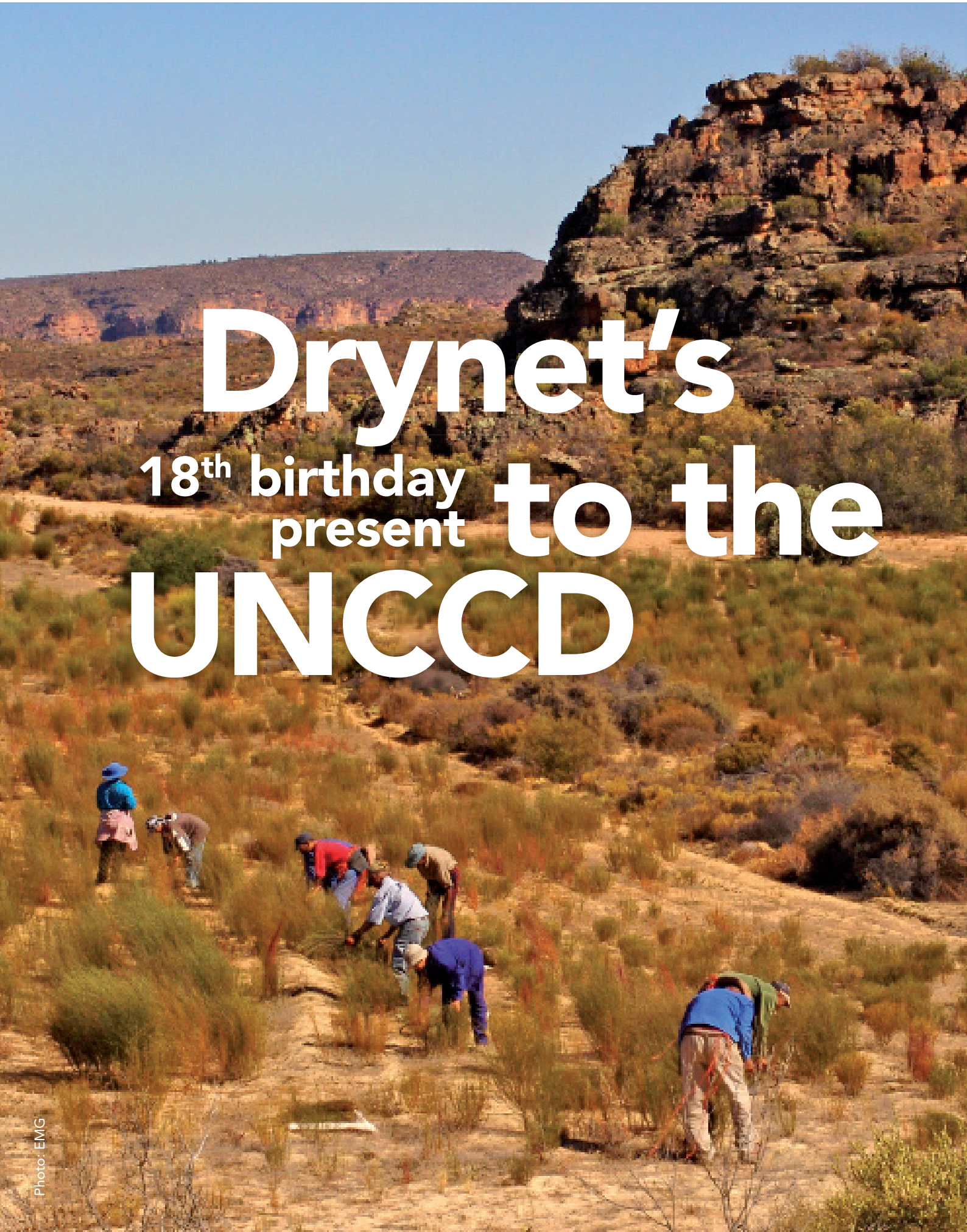
Social movements and NGOs have a role to play in supporting the upscaling of agro-ecological practices and fundamental policy change. There is urgent need to improve the documentation, analysis and communication of successful experiences. It is also important to understand the strategies and dynamics that exist in, highly politicised, decision making arenas. Civil society organisations need to take a broad perspective and build strong alliances, truly exchanging knowledge with farmers and scientists.

The call for change is getting louder. Farmers are becoming more powerful in voicing their concerns and proposals. We are also witnessing a growing movement of consumer organisations that have become conscious of the need for ecologically responsible and socially just food systems.

Policy makers are facing the huge and mounting costs of disasters caused by climate change, land degradation and desertification. If they listen well, and open their minds towards a new way of understanding a multi-functional approach to agriculture, they may well discover that part of the solution is within reach.

The AgriCultures Network and Groundswell International will organise an official workshop during the upcoming conference of the UNCCD in February 2013 in Fortaleza, Brazil. For more information, please write to **Janneke Bruil** (j.bruil@ileia.org) or to **Peter Gubbels** (pgubbels@groundswellinternational.org).

"Leaves falling from these trees are very beneficial to our fields. They serve as fertilizer and enrich the soil. We also use these leaves to cover our roofs. We use the trees' roots to treat diseases and its fruits are edible. Our herd comes to rest in the trees' shade." The Meraidjonga Women Farmers Association in Mali.
Photo: Macinafilm



Drynet's 18th birthday present to the UNCCD

Photo: EMG

The United Nations Convention to Combat Desertification, UNCCD, is celebrating its first 18 years in 2012, which means that, according to UN definitions, it has now reached adulthood. This provides a perfect opportunity to turn on the spotlights and look at the period covering the Convention's childhood and youth – and to present recommendations for an even more successful adulthood.

Patrice Burger, Nathalie van Haren, Duygu Kutluay, Nahid Naghizadeh and Khadija Razavi

Looking back at the past 18 years, we see many problems and challenges in terms of desertification and land degradation. But we also see three promising trends and, as members of Drynet, we feel proud to have helped shape them. The first is that, despite serious difficulties in terms of governance in many areas, with conflicts over tenure and insecurity over land-use rights, we see that *participatory processes* in the management of natural resources are becoming stronger. Local people are taking control over their surroundings and livelihoods by actively taking part in these management efforts, making suggestions, and developing and sharing their know-how and expertise.

At the same time, the discourse about agriculture is changing. Pushed and pulled by food crises and deadlocks, agriculture and its linkages to rural development are back on the agenda of the world's decision makers. Presented as *agro-ecology*, sustainable agriculture by small-scale farmers is receiving more and more attention in scientific and policy discussions.

Thirdly, many *grassroots sustainable initiatives*, in drylands and areas that suffer from desertification, are gaining attention and recognition – and providing interesting lessons and recommendations. The following are just a few examples of what is happening in many places.

Nomadic pastoralists

In Iran, rangelands used to be used and managed by nomadic pastoralists, relying on their traditional norms, customary practices, indigenous knowledge and spiritual beliefs. But since the 1963 Agrarian Reform and the nationalisation of all natural resources, the management of these rangelands has been taken over by an expensive government system. Unfortunately, this path has proven unsuccessful, due to a lack of participation from the users of these resources – the nomadic pastoralists. Over the years, this has resulted in a loss of biodiversity and the complete degradation of the rangeland ecosystem.

Responding to these difficulties, the Centre for Sustainable Development (CENESTA) has been working with various nomadic pastoralist groups (the Bakhtiari, Qashqai, Shasevan and Abolhasain), helping them reclaim their rights, use the land sustainably and conserve natural resources. We start from the understanding that drylands are non-equilibrium ecosystems. This means that they regularly change between different ecological states. Nomadic pastoralists are the ones who know how to detect these patterns and cycles. When policy makers acknowledge this, they implicitly validate the importance of indigenous knowledge and its essential role in the sustainable management of dryland resources.

The research activities resulting from our partnerships have helped all the stakeholders to recognise:

- that seasonal migration is a historical management strategy;
- the importance of strengthening traditional and indigenous governance and management systems;
- the need to promote indigenous knowledge related to conservation and sustainable land management and use; and
- the need to improve the managerial and executive capacities of nomadic communities.

Most importantly, policy-makers now acknowledge that a different approach is needed: one that is based on the participation of indigenous and local communities, and that combines indigenous knowledge with the latest scientific findings about sustainable land management.

Seasonal migration is a historical management strategy. Photo: Samira Farahani

A different approach is needed: one that combines indigenous knowledge with the latest scientific findings. Photo: CENESTA

Saffron flowers

The community of Çütlük lies in south-east Turkey, close to Syria and Iraq. Local agriculture is dominated by irrigated cotton, which has resulted in increased levels of soil salinity and the loss of nutrients. In 2003, the Turkish Foundation for Combating Soil Erosion, for Reforestation and the Protection of Natural Habitats (TEMA) and Harran University explored the potential to reintroduce the production of saffron, one of the most expensive spices in the world, and a crop that used to be cultivated in the area in the 19th century. Saffron grows wild around Çütlük and offers great potential for local value-addition. Equally interesting, saffron production requires only 10% of the water needed to produce cotton.

TEMA and the university worked with the villagers, carrying out soil tests and offering a complete training package, with access to bulbs and the facilities to store them. The farmers who started cultivating saffron doubled their incomes and their social status within the community improved, especially in the case of female farmers. In addition, far less water was used for irrigation and the soils showed signs of recovery.

The transition from cotton to saffron made agricultural practices in the area more sustainable, led to the development of small enterprises and improved villagers' social, economic and educational opportunities. Other communities in the region noticed the benefits and a number of similar projects have been established. These projects have shown the economic and ecological benefits of replacing an imported crop with an indigenous one, adapted to the dryland environment, and highlight the value of biodiversity in drylands. (Unfortunately, some projects have come to a halt due to the construction of dams and the expansion of irrigation in the area, which made the production of saffron no longer possible.)

Sustainable rooibos production

Rooibos tea is indigenous to the Western Cape province of South Africa. It does not require irrigation and is very hardy, and is thus an ideal source of income for small-scale farmers in drylands. Following the apartheid era and the deregulation of the rooibos industry, low prices resulted in an acute problem for small-scale farmers: their returns no longer covered their production costs. In 1998, the Department of Agriculture asked two local organisations, INDIGO and EMG, to engage with communities in the Suid Bokkeveld region and look for alternatives. After a fact-finding trip to producers selling organic rooibos, 12 community members decided to form an organic rooibos co-operative. In 2001, the Heiveld Co-operative for organic rooibos was founded, first selling via middlemen and later benefitting from the Fair Trade and organic labels.

Aside from cultivated rooibos, wild rooibos grows in Suid Bokkeveld in undisturbed natural areas. This used to be harvested by landless people. The Heiveld Co-operative worked with these harvesters and EMG to establish sustainable harvesting standards for wild rooibos. The co-operative markets this exceptionally high quality, biodiversity-friendly product for an even higher premium, providing an incentive for the community to protect the natural areas as a biodiversity reservoir. These standards are now being adopted in other areas where rooibos grows wild.

Recently, after a severe drought, 80% of the cultivated rooibos died while the wild rooibos survived. In the light of current concerns about climate change, this underlines the importance of maintaining wild stock and keeping a wider range of options open for the future. The Heiveld Co-operative now has 56 members, and has established an international reputation for reliably delivering a high quality product.

Joining forces

All the examples above originated from civil society organisations (CSOs) that are now part of the international network called Drynet. Drynet was formed in 2007, when 14 CSOs from all over the world joined forces in order to counter the degradation of drylands. Drynet showcases successful grassroots responses to dryland problems and encourages the up-scaling of successful initiatives and their dissemination to other areas. Over the years, Drynet has succeeded in making its voice

heard in international policy and scientific fora. Drynet also offers participating CSOs the opportunity to share their experiences and knowledge with different communities, and to develop their skills base. This gives participating CSOs more knowledge about sustainable practices and local initiatives on the ground, and more confidence in their dealings with decision makers. During the past five years, Drynet has shown the importance of working with communities living in the world's drylands and the need to involve them in all development and planning processes. In addition, the network has put sustainable solutions for degradation and drylands onto national and international agendas. Our 18th birthday present to the UNCCD is a set of recommendations resulting from these experiences.

Our gift to the UNCCD

Convinced of the benefits of the approaches our partners are following, we recommend UNCCD to ground its scientific discussions around three areas:

(a) Agro-ecology

- Invest in participatory research systems, local knowledge and agro-ecological practices to improve livelihoods and production in drylands. Combine the best of two worlds: traditional practices and knowledge with scientific and formal knowledge;
- Focus, in the first instance, on the people living in drylands; on local markets and food demand, then on regional markets. Only then look further afield.

(b) Local knowledge

- Get a better insight into the realities in the field and learn from local experiences. Invest in things that have proven to be a success. Emphasise the importance of bottom-up approaches, grassroots movements and farmer-to-farmer exchanges and communication;
- Tackle the obstacles to up-scaling by improving evaluation, documentation and communication of good practices and local success stories. If "seeing is believing", then exchange visits are more inspiring than stories on paper.

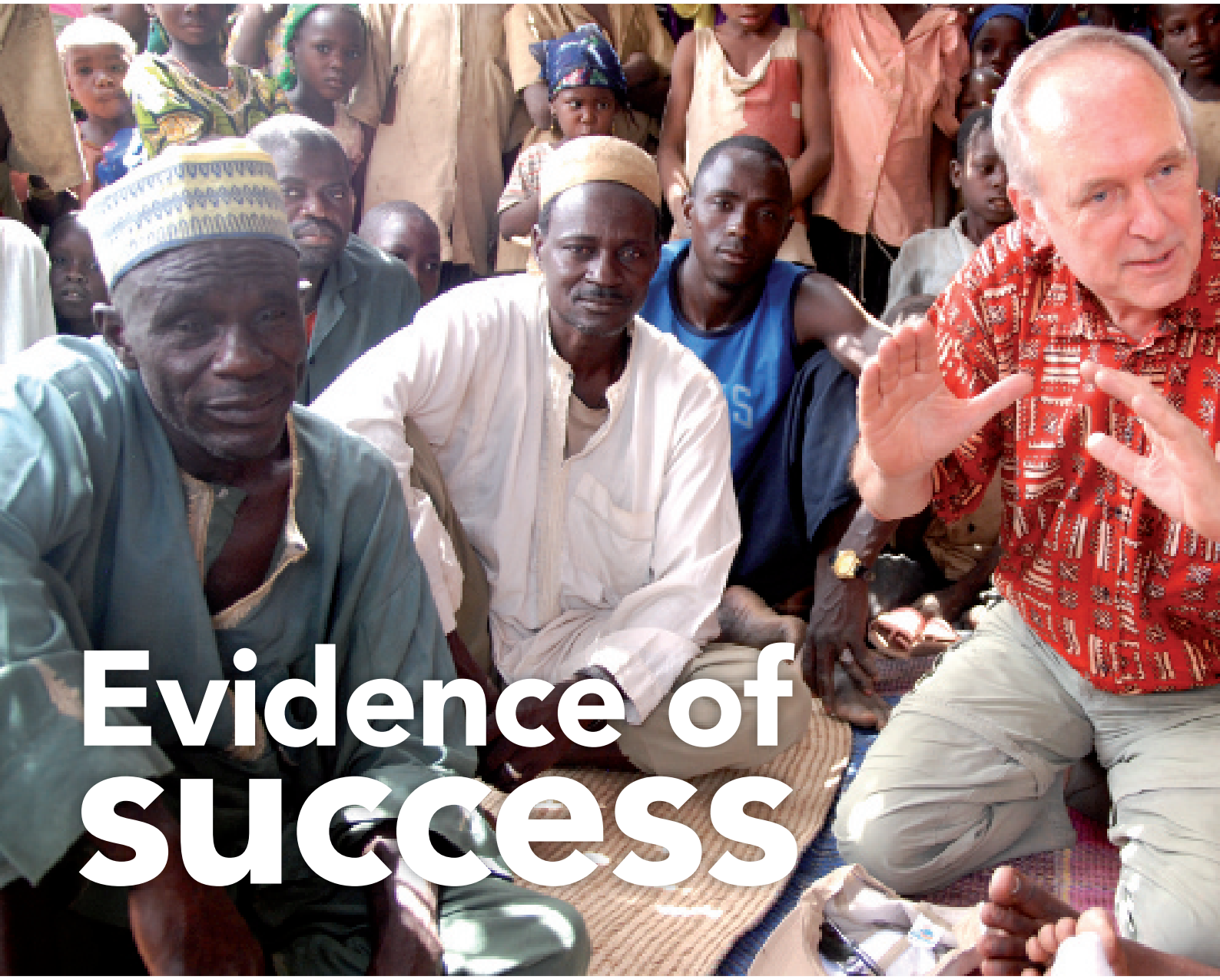
(c) Governance

- Promote greater participation in the management of natural resources and in decision making about ecosystems;
- Use the Right to Food as a guiding principle. Develop sustainable governance systems for the tenure of land. The voluntary guidelines developed by the UN Committee on Global Food Security are an ideal starting point for reviewing and improving tenure, land management and spatial planning.

We congratulate the UNCCD on reaching maturity; it is now ready to take on much more responsibility. Participation of people in drylands management, cherishing sustainable initiatives, and building more and stronger partnerships between land users, governments, NGOs, science and the private sector, are the key elements to follow. We know that wisdom is there, and we wish UNCCD lots of courage and success. Cheers to the future of UNCCD and to people living in drylands!

Patrice Burger is the Executive Director of CARI, France (www.cariassociation.org) and a member of the UNCCD's roster of drylands experts. **Nathalie van Haren** works as Senior Policy Officer at Both ENDS, the Netherlands (www.bothends.org). **Duygu Kutluay** is the International Relations Officer at TEMA, Turkey (www.tema.org.tr). **Nahid Naghizadeh** works as Programme Officer for Community-Based Natural Resource Management for CENESTA, Iran (www.cenesta.net), and **Khadija Razavi** is CENESTA's Executive Director. These are all member organisations of Drynet (www.dry-net.org).

"Focus, in the first instance, on the people living in drylands. Only then look further afield."
Photos: EMG / Pooya Ghodoosi



Evidence of success

Working as a sustainable land management specialist at the Centre for International Cooperation of the Free University in Amsterdam, and as a Senior Fellow at the World Resources Institute, in Washington, Chris Reij is the facilitator of "African Re-greening Initiatives". This is a platform that supports farmers in the process of adapting to climate change and in developing more productive and sustainable farming systems. This platform was launched to help scale up the results of the efforts of those farmers and communities in Burkina Faso and Mali who have shown enormous success in the fight against desertification.

Interview: Jorge Chavez-Tafur


Photo: ARI

Chris Reij went first to West Africa in 1978 as a regional planner, at a time when, after a severe drought period "serious erosion was taking place and yields were declining drastically". Yet, looking back, he feels that desertification is now an even more serious problem. However, "in this 'sea of doom and gloom' you find many 'islands of success' where the degradation rates have not only diminished in the past 30 years, but where things have improved, and which have an enormous potential for scaling up. This is all very positive."

Looking at the world as a whole, are the deserts growing?

All over the world, we see recurrent periods of drought, a severe depletion of soil fertility, and the degradation of the vegetation cover. So, yes, we can say that things are worse. In West Africa, in particular, there was a prolonged drought between 1968 and 1973, and rainfall remained low, and it is still irregular. Farmers have been forced to expand their cultivated areas in order to compensate for the declining crop yields, cultivating in areas which had some tree cover, and therefore cutting the trees in order to farm. During the 1970s and 80s we saw an enormous decline in the vegetation cover in order to increase the total yields – basically by expanding agricultural production into land that was marginal, creating degradation. Today, climate change is only making the situation worse for farmers and herders.

This is a gloomy picture... Yes, it is gloomy. In a way, we are heading into a perfect storm. And unless we do something at a large scale, we are heading into trouble. But things are happening, and we now know much better what to do, and how to do it. And if you look at the Sahel, there is a lot of evidence, with farmers engaged in a very successful approach. If you go to southern Niger, you will find 200 million trees that were not there 20 or 25 years ago. And this is not because farmers started planting trees, but because farmers protect and manage the trees that regenerate spontaneously in their farms. What you see is that the density of on-farm trees has increased, while vegetation in the common lands has degraded, so there is a shift from natural vegetation to agroforestry systems on farms. This is highly relevant to farmers, especially in areas of high population density. And it shows that farmers have come up with systems that can cope with drought.

Is this just one 'island of success'? This is an island, but it is an island of 5 million hectares, which is bigger than the Netherlands. And it happens in a place where farmers had their backs against the wall. Yields had gone down so much, the population densities were so high, the natural vegetation cover almost didn't exist anymore, so women had difficulties with the household energy supply. Without intensifying their agricultural production system and increasing production sustainably, farmers would have been forced to leave, there would no longer be a future for them.

Whose idea was it? Perhaps this is what I like most. This is local knowledge, and local knowledge in action. The contribution of projects,


Photo: Jorge Chavez-Tafur

and even of researchers, has basically been limited to supporting farmer's efforts. We are only catalysing processes, and creating movements. It is the farmers who are experimenting and innovating.

Isn't there a contradiction between producing food and stopping the deserts?

I don't think so. If anything, the contradiction was there before the 1960s, when most of West Africa was following the "modernisation" paradigm, and "good" farmers were those who cultivated a monocrop and who wouldn't have trees on their fields. Even after independence, many governments subsidised farmers to remove the trees from their fields, in order to allow for mechanisation, in the hope of achieving higher yields. It is clear now that this kind of modernisation was detrimental to the sustainability of agricultural production systems, because it causes a lot of erosion, and thus also affects crop yields. What we see now is a reversal of that paradigm. The evidence points in the other direction: without on-farm trees, there is no future for agriculture in Africa's drylands.

So are there more crops now?

You can see enormous differences between the villages with trees and those without trees. Trees produce fodder, so families have more livestock. Trees produce leaves, which are sometimes part of the human diet. Trees produce firewood, which farmers can even sell in the markets for cash which they can use to buy expensive cereals on the market during drought years. Villages without trees do not have the same opportunities, and this translates directly into higher infant mortality rates. I don't necessarily believe in a strict organic approach; adding small quantities of fertilizers can be very beneficial. But this is not just about fertilizers, but about complexity, and about developing complex agricultural production systems which are more resistant to drought, and more productive. And these can be seen in place.

Aren't more ingredients needed?

The technical part of the protection and management of the trees is very simple, but you need village institutions; the people need to organise themselves in order to manage the new tree capital. So the building of village institutions is required, and there are two possibilities. Either you look and see if there are traditional institutions which can be revitalised, as it is happening in some parts of Mali, or you help build new village institutions which can do the job, as is happening in some parts of Niger. Either way, these village institutions need to have a balanced representation of men and women, and also of herders, and also of the young. And then you see that, over the years, these village institutions do their job by, for example, sanctioning those who do not respect their rules for managing their resources... These village institutions are developing into problem solving institutions: when other problems emerge, villagers can meet and discuss and come to an agreement. And the villagers soon realise that there are also neighbouring villages going through the same process, so they are now in the process of building inter-village institutions. It takes time, as it is a complex process, but it is happening, and it works.

Don't you also need land ownership?

We are talking about individuals, managing their property. So this only works when farmers have the exclusive rights to the trees on their farms. Back in the 1980s, the land and all the natural resources belonged to the state, a heritage of the French colonial times. But this started changing after 1985. Clearly defining issues such as the ownership of the land and of the trees is a key condition for success. In that sense, it is very important to work with national

governments, and to engage in dialogue in order to create enabling agricultural development policies and forest legislation which gives farmers the explicit ownership of their own farm trees.

So you need a national-level framework that supports, or at least does not go against what farmers are doing... Exactly. You need policies which enable farmers to do things, and also policies that give them an incentive to take care of their resources. We need good policies and legislation. It is vital to create grassroots movements and work from the bottom up, but we also need to go from the top downwards, creating and enabling national policies and legislation. There is a role for both. I think that farmers can be even more effective if the national policies and legislation support this process. There are no other major obstacles which would prevent us from being successful, so I think that success is within reach.

So are we going to see 5 million hectares of trees elsewhere?
We will see them soon in many other places. But we need a systematic strategy for scaling up the agroforestry successes seen in Niger and other areas. This would have to include farmer study visits, or bringing farmers from one place to another, and helping them see what other farmers are achieving. Another component could be to spread information by systematically using ICTs, mobile phones and rural radio, and giving the floor to all those farmers who have so much to say. In short, it requires an effective and efficient knowledge management programme. And this programme needs to include policy makers. Many national policy makers have no clue of what is happening on the ground. You need to bring the policy makers from governments and donor agencies into the field, and show them what is happening on the ground, so that they get inspired by success, and support similar processes.

And what must they do? If they are Members of Parliament they will see if there is a need to revise the forestry legislation in order to make it more supportive. If they work with media and communications, they can find ways to communicate these achievements to a larger section of the public. There is a whole toolbox that can be used for scaling up.

Which brings us to international platforms, such as the UNCCD. What would you tell them?
With Luc Gnacadja at the helm, the UNCCD is in good hands, and their message is pointing in the right direction. The problem is that not all the countries that signed up to the Convention are taking all the right steps to get there, so we still have a lot to do.

For more information, please contact Chris Reij at c.p.reij@vu.nl , or visit the website of the Africa Re-greening Initiatives: www.africa-regreening.blogspot.com

Natural regeneration

"Having gone to the Sahel many times, the first time I really saw success was in the Yatenga region of Burkina Faso, where an agroforestery project was supporting farmers in improving a traditional technique of putting putting stones in a contour. This helped them reduce or slow down the flow of water in the fields, which caused water to infiltrate, also reducing damage downstream. This led to an increase in the numbers of trees regenerating, and thus to many more trees in the fields. Several years later, I was sitting with farmers in Senegal, who just told me to look around. 'Look around you, we've been planting trees since 1984, what do you see? Nothing'. But then they took me to another place, and said 'we've been protecting the natural regeneration in this area, and what do you see...?' And it was lush green. You saw the young trees coming up and growing quickly.


Photo: F. van Schoubroeck

"Of course, there is a limited number of species that regenerate, and the whole process also depends on what you have as 'seed memory' in the soil. In terms of cost-effectiveness, however, the natural regeneration approach is better because you skip a nursery, you don't need to transport your trees to the areas where they are going to be planted, and you dont need to water them after planting. No wonder that more and more farmers are picking this up."

Dams and alpacas

The combination of a degraded landscape and climate change is having a severe impact in many places. In the Peruvian Andes, a water harvesting approach is proving to have positive results – especially when the construction of dams and canals goes hand in hand with an approach that leads to stronger local organisations and the involvement of all villagers and support from other local stakeholders.

Fernando Camiloaga Jiménez

DESCO is a Peruvian NGO that has been working in different parts of the country for almost 50 years. Since 1985 it has been supporting farmers and alpaca rearing families in the country's southern Andes. Farmers in this area depend on the commercialisation of alpaca meat and wool. For more than 10 years DESCO focused on finding new market opportunities and on the possibilities of adding value. The southern Andean region is one of the parts of the country where poverty levels are highest and this is combined with severe land degradation. Different studies conclude that the latter is mostly the result of disappearing vegetation cover, and a result of increasing population and animal pressure. This is the main reason why, in 1996, DESCO decided to support water harvesting projects.

The need to harvest water comes from the need to improve, or at least stop the degradation of the habitats where alpacas live. In addition to severe losses in the mountain soil's fertility, climate change is easily visible in this region: the glaciers which feed all the rivers, and the snow on the mountaintops, are noticeably getting smaller – which means less and less water flowing down into the valleys. One strategy to cope with this problem is to try to store part of the water falling during the rainy season and use it during the dry months. A total of 137 small dams have been built in the past 15 years, each of which, on average, can hold 65,000 m^3 of water. Starting in the province of Caylloma, the benefits are now being seen in more than 100 high-altitude localities in the Arequipa, Puno and Ayacucho regions.

More than infrastructure

A first step is the identification of the best place to build a dam, making use of a natural depression or a small lake where large volumes of water can accumulate. Next comes the collection of the necessary materials (sand, stones and cement; not always easily available at 4,000 m above sea level) and the excavation and construction works. Yet, water harvesting does not only mean building dams and canals. In addition to the necessary infrastructure, our work also focuses on developing the necessary skills and capacities to build and manage each system. This involves ensuring the participation of all the villagers in order to secure their sense of ownership and responsibility.

Once a location is selected, the process starts with an agreement that clearly specifies all the roles and responsibilities. At first, all the costs were equally divided between DESCO and the local organisation, but the positive results have motivated the municipalities and regional governments to cover up to 50% of all costs. While DESCO takes responsibility for all the construction works, the communities contribute with local materials and labour, and all the villagers agree

Ensuring a sense of ownership. Photo: DESCO

to join the local organisation. This is important in order to ensure a fair and equitable distribution of water throughout the year, and the sustainability of the system of collecting, storing and distributing water. During the past 15 years we've seen that the simplicity of the process ensures its replicability. We have also seen that, gradually, more and more villagers are becoming local engineers, contributing with their recently-acquired skills so that others villages can initiate a similar process.

Yet the success seen does not only depend on the dams and canals built, or on the capacity of building them. In each of the 137 cases, the local organisation plays a key role. The existing organisations are strengthened with the creation of an irrigation committee, with roles and responsibilities drafted in accordance to the national legislation, meaning that will be officially sanctioned and recognised by the authorities. While the internal regulations have helped minimise the number of internal conflicts (among water users within one village), the official recognition has helped all users in their fight against third parties in need of water – most notably mining companies large and small-scale. Unfortunately, this problem is becoming more and more frequent in the mineral-rich Andes.

Water and more

The impacts of our work are not limited to the availability of water for irrigation and for household use. Very big changes have also been seen in the irrigated pastures. A detailed analysis was done in different villages (including Quenco Cala Cala, Cauca, Hanansaya and Toccra) where, 46 months after the water storage facility had been completed, plant density was more than 120% higher and the yields in terms of biomass were almost 200% higher. Local biodiversity, the number of plant species and the number of birds, has also increased. And better pastures translate immediately into more animals (up to twice as many) and healthier herds. Villagers regularly mention that animals weigh more when born and that their survival rates are higher, all of which, directly, translates into higher incomes.

Many positive developments have also been seen in the local organisations, especially in terms of commitment and participation. In some cases, the creation of the irrigation committees has led to better resource management arrangements and fewer conflicts (for example, over the use of communal land). Local organisations have also benefitted form the interest shown by the authorities (municipalities and regional governments) and other institutions (e.g. local NGOs). Recognising the benefits of a water harvesting approach, they are interested in working together towards higher yields, productivity and incomes – by paying special attention to the fight against desertification and land degradation.

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Ready to store and distribute water during the dry months. Photo: DESCO

A pathway to change

People and communities can be amazingly resourceful and innovative when adjusting to change, yet the challenges today are hugely complex. How can we work together to make the changes needed if we are to feed 9 billion people while taking care of the environment?

Patti Kristjanson and Ewen Le Borgne

Tackling complex problems requires trying new approaches, sensing and taking advantage of new opportunities and tapping into collective wisdom and knowledge. "Social learning" facilitates these processes. Social learning approaches rely on knowledge sharing and joint learning to change perspectives, discourses and practices. They are themselves complex but transformative approaches that tighten and enrich the social fabric of change.

Scientists have a key role to play in catalysing change, but we haven't always tapped into the full potential of diverse partnerships, multi-way communication, co-operation and collaboration. Bridging such gaps between various actors can help us support local decision-making processes related to climate change and food security.

Our vision of success We want to see more people embracing the idea of joint, transformative learning, of co-creation of knowledge and solutions. This is not a new idea. But the imperatives we are facing now mean that it is high time for a more conscious articulation, promotion and facilitation of social learning approaches in research.

Building on a workshop held in Addis Ababa in May 2012, CCAFS and its partners are working together to develop a strategy to address social learning in agriculture, food security and climate change. These efforts combine a learning and sharing space set up to discuss social learning in climate change with a series of scoping and assessment projects to take this agenda forward.

Already this year, CCAFS is partnering with PROLINNOVA, the international platform to promote local innovation processes, to explore ways to strengthen farmer-led processes that contribute to local resilience to change. IDS and IIED are compiling models and evidence to monitor and evaluate the impact of social learning approaches. Another recent study looked into over 120 social learning initiatives undertaken throughout CGIAR. The intention is to use these to influence how CGIAR scientists, other researchers and the communities they work with apply and communicate their shared knowledge and transformative learning experiences.

What do you think are key components of an effective strategy to use social learning to improve local decision-making about agriculture, food security and climate change? What possible partnerships should we explore? And what issues should we address?

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Strategic collaboration

The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) addresses the challenge of global warming and declining food security. One of the CCAFS research themes, "Integration for Decision Making", is exploring approaches and methods that enhance knowledge-to-action linkages with a wide range of partners, and assemble data and tools for analysis and planning. Its aim is to develop decision support and communication tools so that policy makers, development partners, researchers and farmers can make decisions with a greater understanding of the interactions between local conditions, national policies and programmes, and international development, in the face of multiple drivers of change.

Land Sovereignty

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In what activists have dubbed the "global land grab", transnational investment in land has grabbed media headlines worldwide. While attention has focused on the role of hedge funds, sovereign wealth and foreign purchases of vast tracts of land in Africa and Asia, recent research is uncovering a broader pattern. As land values increase, land ownership is concentrating everywhere – even where there have been few reports of foreign land grabbing. Land deals driven by national and international capital expansion are occurring in areas of longstanding inequity, racism and conflict. They involve real estate speculation, mining, agro-fuel production, industrial forestry, and "flex crop" production, often led by local elites. The patterns of dispossession are deeper, wider and potentially devastating for marginalised communities everywhere.

The responses to land grabs – thus far scholarly papers, media reports, place-based resistance and global campaigns for transparency and voluntary codes of conduct – have helped to bring the issue to public attention. But as land grabs spread around the world, it is becoming clear that regulating and writing about land grabs is not enough: land grabs must be stopped. The challenge is for communities to mobilise for the right to land and territory *before* they are besieged by speculators, hedge funds or extractive industries. This requires a *proactive strategy* that goes beyond reactive responses to land grabs and actively advances alternative projects and alliances for land use and ownership. It also requires vigilance regarding the political, legal and infrastructural build-up that precedes land grabbing, so communities can prepare to resist.

Reversing the land grab trend demands a powerful, integrated response from under-served communities, civil society and social movements. It means building a pro-active global-local movement based on the right of communities and peoples to sustainable, land-based livelihoods; their right to have a democratic say in how the land they live on is used, and an equitable share in the social, environmental and economic benefits of that land. In short, it requires a broad-based movement for *land sovereignty*. Much like food sovereignty, land sovereignty brings together the demands of social movements from the South and North and from rural and urban settings.

Land grabs are making projects for food security and sustainable agriculture moot efforts… Farmers' organisations, social movements and development NGOs need to find "common ground" to protect peasant farmers, forest dwellers, indigenous communities, family farmers and urban agriculture from the devastation of dispossession.

True champions

Farmers' knowledge and experience has not been adequately translated into policies and strategies by governments, the private sector or civil society organisations. In general, not enough is known about these transformation processes. Is there a glass ceiling that limits the spread of good agrobiodiversity practices? The Agrobiodiversity@knowledged programme, started by Oxfam Novib and Hivos, aims to collect and disseminate ideas from all over the world to add insights and evidence to current debates and to strengthen good practices worldwide.

Joy Daniel

India's small-scale farmers, most of whom farm less than 2 hectares of land, play a central role in feeding the country's population of more than one billion people. Yet, these are hard times, and many men migrate away from the countryside. As a result, women are becoming increasingly involved in farming. They are also often guardians of local knowledge, which increases the importance of their role. One of these many women is Shakuntalabai Sukhdeo Mule, a champion of organic farming and biodiversity conservation. She lives in the village of Shekta, in the state of Maharashtra, a very dry part of India. Her very simple demeanour belies her deep knowledge about farming and the region's biodiversity. She has spent the past twenty years of her life talking about organic farming and biodiversity, and she "walks this talk" – doing at a village level what the Agrobiodiversity@knowledged programme aims to achieve at a global level.

Farmer and organiser

Shakuntalabai, as she is widely known, become a member of a local women's group, or *mahila mandal*, in the early 1990s, and because of the interest and enthusiasm she showed, she was soon asked to be the leader. IIRD, the Institute for Integrated Rural Development, invited her to participate in a series of training courses in organic farming. Recognising the difficulties farmers were going through, and the clear benefits of organic farming, she shared the knowledge she gained among the women in her village, encouraging them to take up organic methods. Gradually, the number of farmers involved increased, and she began to help establish farmers' groups in the neighbouring villages. These groups have been developing rural enterprises, drawing on members' savings for financial resources and technical support from development organisations.

As the number of organic farmers increased, they became interested in developing a system that would

Ms Shakuntalabai (centre) at the Shekta seed bank. Photo: IIRD

help farmers to certify their products as organic, without relying on (often expensive) external institutions. Following what is now known as a Participatory Guarantee System (PGS), farmers share information about inputs, processes and yields, and all of them are regularly involved in documenting and assessing this information. Certification improved their commercial opportunities and encouraged them to set up the Mahagreen Producer Company (in March 2011). This farmers' co-operative already has 1,100 members. The company is run by a board of 9 Directors, all women farmers, with Shakuntalabai acting as the Secretary. In just a year, Mahagreen has grown significantly and now sells its (certified) products in the local market, as well as at markets in Hyderabad, Pune, Mumbai, Bangalore, and many other places in south and central India.

Seed banks The rains, which most farmers depend on, are scarce in Shekta and the Marathwada region, and they have been lower than normal this year. Under these difficult conditions, the best option is to consider growing crops that are drought resistant and provide nutritive fodder for the livestock. Millets, which require less water, are widely cultivated by local farmers. However, knowledge of the traditional varieties of millets (and other crops) that are well adapted to these dry areas is declining and they are less frequently grown than before, largely because of the promotion of hybrid seeds by seed companies and government extension programmes.

Led by Shakuntalabai, the discussions in Shekta led to the establishment of a community seed bank, where many farmers now exchange traditional seeds. At the moment, the seed bank contains about 200 varieties of seeds, including traditional vegetables such as cluster beans, chillies and brinjals (aubergine). The bank has helped many farmers grow these varieties of crops again, increasing the amount of food that is locally available. Villagers were quick to notice that, while cash crops have been adversely affected by the drought-like conditions of 2012, the millets and the traditional crops withstood the testing conditions.

Shakuntalabai and her colleagues are going against the norms of corporate agriculture, which promotes the use of agrochemicals and hybrid seeds. This involves facing many challenges. She remains undaunted and continues to do what she knows best – talking and walking the organic way. Together with the whole community, she has been able to turn the desirable into the attainable.

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My biggest reward is social status and knowledge; not money

"At the age of thirteen, I was married off to a man of 45. At fourteen, I had a son. By fifteen, I was a widow. My in-laws bullied and exploited me, then kicked me out and kept my son. A rich man adopted me. In the daytime I worked on his land. He gave me a small salary. I also did nightshifts to earn money to give my son a better education, later on in life. Then, one day, a farmers' organisation came to my village and asked if I was interested in organic agriculture. I said I was. In 1992, I started as a volunteer, and now I take care of eight farmers' groups. My own organic farm is about five acres. I grow millet, sorghum, chickpea, and cotton. I have two bulls, one cow and a cart. I bring other farmers to my fields to show them what organic agriculture is.

"Creating a farmers' groups starts with identifying people who are interested and who have a lot of biodiversity. In my village alone, some fifty farmers showed up to the first meeting. I selected twenty of them to start developing a joint enterprise. The members contribute 100 rupees per month. A committee of five members takes care of environmental issues, seeds, financial management and information. They keep note of every aspect, from input to output, from irrigation and compost to the amount of workers and the revolving funds. We also run an organic shop, and every Friday we have an organic bazaar in two cities to sell our certified products, and to raise awareness among consumers. Farmers sell directly to the customers, mainly lower and middle class people. We do not deal with middlemen, so the income of the farmers is even higher.

"Being a development animator, I have access to a lot of knowledge on health and agriculture. My biggest reward is social status and knowledge; not money." (Karoline Bias)

Roles and regulations

Since the 1980s, some 6 million hectares of agriculture land in the Sahel have been covered with trees. Yet, this area could be much larger. The support provided to the rural areas of most Sahelian countries depends on public funding and on the contributions of international donor agencies, so the number of projects, or the number of farmers that can be involved, is limited. Since it took 30 years to cover 6 million hectares, many argue that it might take too long to cover the entire Sahel. Does scaling up depend only on the national and international funds for rural development? Or would there be other ways of reaching out and involving many other farmers?

Frank van Schoubroeck and Mamadou Fall

Mr Dame Diop is a farmer in the village of Bayen, near Thiès, in Senegal. We met him last October in Ouagadougou, Burkina Faso, at an international conference on Farmer-Managed Natural Regeneration, an increasingly popular technique for increasing and managing the presence of trees on agricultural land. Mr Diop talks in French, slowly but articulately. *"When I was young, there was lots of forest in our village. But in the 1970s, our country joined many of the so-called Green Revolution programmes. The national government instructed farmers to intensify traditional shifting cultivation practices, clear forest and start growing groundnuts. In return we received subsidised fertilizer and seeds. We grew groundnuts to sell and bought food to eat ourselves. In the beginning all went well. But then there were severe droughts, the government's policies changed and fertilizer subsidies stopped. We were left with empty stomachs. On 12 December, 1992, some people from a project visited our village, and since then the project has helped us to restore trees on 57 hectares of land. These trees appeared to do miracles. They grew quite big in five to ten years, and we grow grains and horticultural crops between them. Crop production is stable and, even in dryer years, none of us needs to buy food from outside. In most years we can sell crops on the market in Dakar."* Mr Diop's main interest is in finding a way that more farmers in his community can benefit from this approach.

Yields and taxes

Mr Ibra Diakhithé, President of the Rural Council of Niakhene, 100 km north of Dakar, thinks that people can earn a living through fighting desertification. With an annual rainfall of 200 to 300 mm, Niakhene is where the Sahel and the Sahara meet. *"During the drought of the 1970s, at least one third of our people migrated, and whole villages were abandoned. This could happen again very easily as a result of global warming. But we are working hard to avoid it."* Mr Diakhité gave a stubborn smile. *"A few years ago the government handed over environmental management to the local government. We are happy with this mandate, even though we only have small budgets at our disposal. With the little money available for our Rural Council, I prioritised actions that would help people make money.*

Mr Assoumane discusses the role of foresters with farmers in Rouda Adoua, Niger. Photo: Frank van Schoubroeck

For example, when I started as President in 2002, 42 out of the 62 villages did not have running water. I managed to get running water for all villages. This helped to reduce the workloads of women, so now they have more time to take care of their fields and their trees. Trees on the farms help farmers to create protected horticultural gardens, that are now equipped with drip irrigation. In this way, people have business opportunities, and do not need to move away in search of work. The greener the village is, the more people can produce." This is undoubtedly a successful story, but does it help the Rural Council? *"You might think that more business would mean more revenues for the local government. Unfortunately this is not the case. We only levy a 'solidarity tax' of 1,000 francs per person per year* (about € 1.50)*; so more local businesses does not mean that we get higher tax revenues. We still depend on the support of foreign-funded NGOs and programmes."*

Yet a local tax on, for example, agroforestry products might be a good idea. Farmers and researchers have shown the many benefits of trees on agricultural land in the Sahel. Trees have deeper root systems than annual crops, and some species can withstand droughts remarkably well. Trees also help rainwater from short heavy showers to penetrate deeper into the soil, helping ensure that crops make it to the end of the rainy season.

Some researchers claim that there should no more than 25 to 40 trees per hectare; many farmers disagree. Mr Ali Meyno, a farmer in Aguié, in Niger, grows up to 150 trees per hectare. *"I combine tree growing with micro-dosing fertilizer. This gives me cereal yields of up to four tons – and I also sell fuel and construction wood on the rural market. I also rent barren land for a very low price. The first thing I do is start bringing the trees back and improving the soil, which immediately doubles yields. The following years I manage the tree coverage on the land and my yields are even higher. Thus I make a good profit. And after three years I hand back the restored land to the owner."*

Mr Ali and members of his community benefit from strict local government procedures that regulate land tenure. People who lend or rent land are sure they will get it back after the agreed period. And farmers who invest time and resources in regenerating trees retain the harvesting rights once these trees yield wood. As a result, Aguié has a lively wood market, from where trucks leave every day to towns in Nigeria. The mayor, Ousmane Boubé, is happy with the financial results. *"The market committee decides who should pay taxes,*

and how much. We share the tax money between the state, the local government and the technical services. These services support farmers by running a capacity-building programme on agroforestry." This is a virtuous circle: the more people produce, the more revenues the local government gets, which allows for more and better capacity-building programmes, and also for better land registers.

Different roles, different opinions

Why is it so difficult to replicate this success? Scientists such as Antoine Kalinganire, at the World Agroforestry Centre in Nairobi, recognise at least one reason. *"Foresters should leave the farmers alone!"* he exclaims with a big laugh. *"Let the foresters manage the forests, and not the farms. Farmers treat the trees on their land like a regular crop. They plant, maintain, cut and sell the produce, following their socio-economic logic. When foresters interfere with the growing of trees on farms – which happens all over Africa – they cannot establish fully productive systems. Foresters oblige farmers to apply for permits to fell a tree, even when tree densities are high. The result is that farmers cannot manage their trees economically. No wonder they clear trees and invest exclusively in annual crops – and miss part of the steady income they could have had."*

Mr Maizombou Assoumane, a forest guard from Doutchi, Niger, does not agree: *"We only protect trees so that outsiders or irrational farmers do not cut them down"*. This misunderstanding of the role of foresters seems to be backed by stories such as the one told by World Vision's Martin Nzale: farmers in a village in Kaffrine, Senegal, were happy with the effect of the trees on their soils, which provided shade and fire wood. Then last year this changed: *"A rumour went around that fields with high tree density would be taken back by the forestry service. Many people were afraid and had their family members cut down the trees in order not to lose their land. These trees could have served as their pension! And now they are all gone."*

A group of farmers we met in Rouda Adoua, a village in Niger, also regarded the forester as a policeman. Asked what they would do if the foresters left their region, they immediately said that *"we would cut down all the trees!"*… Then one of them timidly contradicted the group: *"Maybe not… I think we would keep many trees to fertilise the land."* After a ten minute discussion, most people agreed: *"If we didn't need the foresters' approval to grow and cut trees, our land would soon be covered with a variety of species that we could harvest to use and sell."*

Back to basics

Mr Diop, the farmer from Thiès, was witness to the discussions at the Ouagadougou conference, and welcomed the ideas of establishing a large-scale farmer-to-farmer project for promoting agroforestry. He is convinced that the local authorities will welcome this project. But he also wonders if we do not need another generation of projects that link agroforestry to tenure rights and markets. In many parts of the Sahel there are more and more trees following the promotion of agroforestry. In some small pockets, local conventions on the tenure of land and trees, together with a lively market, have helped entrepreneurial farmers to re-green their land. What they need is clear regulations to support entrepreneurial agroforestry – for all those involved.

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From sand storms to a well-tested approach to higher incomes. Photos: Frank van Schoubroeck



From the local to the global

Many different local strategies are being employed to combat and prevent desertification and degradation. By linking these with scientific insights relevant to the local context, the DESIRE project has identified, evaluated and tried out a set of locally appropriate land management strategies. These strategies are now being shared with a range of stakeholders, from farmers to policy makers. According to DESIRE's co-ordinator, Coen Ritsema, "it is truly a global approach, where we look at interesting local strategies that can be expanded all over the world".

Text: Laura Eggens Illustration: Fred Geven

Alterra (part of Wageningen University in the Netherlands) and WOCAT (the World Overview of Conservation Approaches and Technologies) have been running a research project on the *Desertification, Mitigation and Remediation of Land* (DESIRE). From 2007 to 2012, researchers studied 17 desertification hotspots around the world, covering a wide range of problems, from soil erosion by wind or water to salinisation and droughts or flash floods. "Scientists and land users worked together to deliver a tangible product", explained the DESIRE co-ordinator, Coen Ritsema.

At every study site, researchers discussed the context-specific problems with a variety of stakeholders. They then proposed a number of scientifically developed solutions, which might complement the experiences of local land users, and gave land users the choice of testing the most promising strategies. Many, if not most, opted for conservation agriculture techniques. "Unsustainable, expensive and polluting strategies are rarely selected by land users," said Mr Ritsema. The strategies were then jointly evaluated. Increased productivity was not the only criterion for evaluating these strategies; their impact on people's livelihoods and in preserving local and regional ecosystems were also considered. "We evaluate the revenues, but also the costs and benefits: the activities have to be interesting to land users in terms of costs as well."

Knowledge sharing was an important component of the project. The results of the local assessments, including benefits and costs, have been translated into different communication packages, ranging from simple posters and brief information sheets to videos, technical reports, policy briefs, step-by-step guidelines and a book. "The database of strategies has an enormous educative value. Of course, what works in one area will not be successful *per se* elsewhere. We are creating a basket of options, from which land users can choose, and they have to test what works in their own area on a trial and error basis."

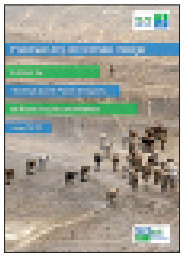
Successful interventions can only be effective on a larger scale if they are shared with practitioners, extension services and policy makers in other regions. "We have created white papers and policy briefs for national and international decision makers, giving them ammunition for their policies. We also offer simple and informative leaflets in a format that is understandable by land users." The DESIRE approach has already been incorporated in publications and initiatives by the United Nations Convention to Combat Desertification (UNCCD), FAO and the Global Environment Facility. Now, the project will focus on creating an interactive online tool to make all the possible strategies even more easily visible for the end users. "We can share with a wide audience that there are available solutions to degradation!"

The outputs of the DESIRE project are freely available online in the multi-lingual *DESIRE Harmonized Information System* (www.desire-his.eu). On this website, the research programme and its results are available in a variety of forms. Visitors to the project website (www.desire-project.eu) can download the practice-oriented book *Desire for greener land*, which explains the methodology of the study and all the strategies tested at the study sites.

A wolf in sheep's clothing? An analysis of the "sustainable intensification" of agriculture

E.D. Collins and K. Chandrasekaran, 2012. Friends of the Earth International, Amsterdam. 28 pages.

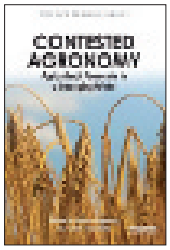
It is increasingly recognised that intensive high-input agriculture is no longer an option. It is a major cause of natural resource degradation and depletion, climate change and the loss of biodiversity. This has been reason enough for some organisations to change direction, and make "sustainable intensification" a top priority. But what exactly does this phrase mean, and whose interests does it serve? This report describes the origins, practices and technologies behind it. The authors conclude that the "sustainable intensification" is being mainly driven by the agendas of corporations, scientific institutions and international donors and the voices of small-scale farmers are being neglected. Equally problematic, efforts that build on farmer's knowledge, such as agro-ecology, are taken out of their context and in an attempt to rework them into uniform technology-based approaches.



Food security and climate change

High Level Panel of Experts on Food Security and Nutrition, 2012. HLPE, Rome. 98 pages.

Given the current trend, temperature rises of 4°C can be expected by the end of this century. This will reduce the productivity of existing food systems and threaten food security, especially in the most vulnerable households. This report examines the relation between climate change and food security and, in so doing, makes some interesting observations and recommendations. First, climate change adaptation needs to occur in the broader context of building more resilient food systems. Second, given the diversity of social and agro-ecological contexts, no single approach will be universally applicable. Solutions will differ. Third, it is important to ensure that farmers have a voice in the design and implementation of policies at all levels.



Contested agronomy: Agricultural research in a changing world

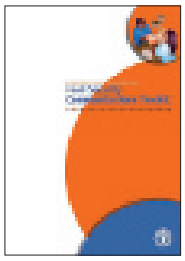
J. Sumberg and J. Thompson, 2012. Routledge, London. 222 pages.

Agronomy is often seen as an objective science, concerned with unravelling the universal laws in the working of the farm. This book challenges this view. Agronomic research takes place in a social, political and economic context. It explores some of the major developments in agronomy since the 1970s. It shows how the emergence of the neoliberal project and environmentalism have shaped the practice of agronomic research in developing countries. The authors use various case studies that illustrate emerging practices such as agricultural intensification, conservation agriculture and participatory soil fertility management. These studies cover a wide range of locations, including south east Asia, Africa and India. The authors use these cases as the basis for a proposing a new sub-discipline: political agronomy.

Crops of the future

M.M. Robin (director), 2012. ARTE France. Video, 90 minutes.

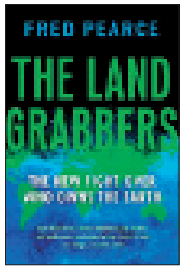
In a world dominated by large corporations and industrial agriculture, even the most dedicated proponents of agro-ecology sometimes lose hope. This documentary will help them regain faith. After "The world according to Monsanto" and "Our daily poison", this is the final chapter of Marie Monique Robin's trilogy. In a quest to find solutions to our planet's food crisis, Robin looks at various agro-ecological farms and farmers in Europe, Asia and Latin America. In her journey she meets leading voices in the field of agro-ecology, including Miguel Altieri and Olivier de Schutter. The conclusions are clear: there is hope, but a shift in the dominant agricultural paradigm and a reorganisation of the world's food system is required.



Food security: Communications toolkit

Food and Agriculture Organisation, 2012. FAO, Rome. 213 pages.

Many organisations invest heavily in researching and analysing food security, but often do not effectively communicate their findings. But such communication is important to ensure that the findings reach their intended users and that action is taken. This toolkit covers a wide range of communication channels, offering guidelines on what channels to use for a given audience and objectives. Attention is given to different forms of media, including newspapers, radio, television and social media. It also offers advice on how to present information to policy makers and how to lobby for food security, and tips on how to structure and improve a variety of report formats, including policy briefs and early warning bulletins.



The land grabbers: The new fight over who owns the earth

F. Pearce, 2012. Beacon Press, Boston. 336 pages.

The number of publications on land grabbing is rising explosively. What makes this book special is that it is the first global journalistic account of the issue. It is accessible to those unfamiliar with the topic, and it also portrays the human side of policy makers, investors, and of the affected local communities. Foreign governments and investors are buying land, which governments are selling to reach short term development goals or the personal benefit of politicians. Local communities, often lacking property documents or recognition of customary rights, are displaced. The book confirms the seriousness of the problem: "Every day, parcels of land – the size of Wales and larger – are being gobbled up".

Desertification

The causes of desertification and the resulting problems are carefully explored in "Beyond any drought: Root causes of chronic vulnerability in the Sahel" (P. Trencht *et al.*, 2007). Two other reports, "The state of the world's land and water resources for food and agriculture: Managing systems at risk" (FAO, 2011) and "Economics of land degradation: The costs of action versus inaction" (E. Nkonya *et al.*, 2011) focus on the causes and costs of land degradation. A classic study that analyses how science and policy discourse on land degradation can sometimes misinterpret local realities is "Misreading the African landscape: Society and ecology in a forest-savannah mosaic" (J. Fairhead and M. Leach, 1996). There are also more hopeful studies. "Escaping the hunger cycle: Pathways to resilience in the Sahel" (by P. Gubbels, 2011) looks at how aid can become more effective in reducing vulnerability to drought in the Sahel, and includes specific sections on agro-ecology. The website of the United Nations Convention to Combat Desertification (UNCCD) also has a large number of resources addressing this topic. The film "Lessons from the loess plateau" (J.D. Liu, 2009) shows how a self-sustaining ecosystem has been created in the dry and degraded Loess Plateau region

in China. "Re-greening the Sahel: Farmer led innovation in Burkina Faso and Niger" (C. Reij, *et al.*) looks at traditional agroforestry, water and soil management practices. (LvdB)

Tackling degradation together

Livestock production is the most important economic activity in the Butana region of eastern Sudan. In this region, women of the town of As-Subagh took the initiative to improve their community's fodder production – while at the same time helping to restore degraded lands in their area. They have been supported by the Butana Integrated Rural Development Project (BIRDP), implemented by the Government of Sudan and IFAD.

Mohammed ELhassan Ali

Like most of Sudan, Butana experiences erratic rainfall, high temperatures and strong winds. Traditionally, herds grazed freely. However, an increase in livestock populations over recent years, together with the presence of nomadic pastoralists from South Sudan and fluctuating rainfall patterns, has contributed to the severe deterioration of grazing resources. This led to the collapse of the existing economic resource base, particularly affecting sedentary farmers, who lost a substantial number of animals.

In 2006, to support these farmers, the local government fenced a large area of land close to As-Subagh, trying to protect it from erosion. This was to serve as a demonstration plot to build awareness about environmental degradation and the need for natural resource protection, conservation and restoration. The fence was also intended to protect the area against unwanted grazing, allowing space for the cultivation of crops. However, no additional activities were carried out and, eventually, large portions of the fence were looted or dismantled, leaving the land unused and unprotected.

A new approach

In 2010, BIRDP staff in As-Subagh were restoring the fences, when something unexpected happened. Eight women, most of them divorced or widowed, approached them and asked about the project's intentions, and about the possibility of using the enclosed land. Erosion and the degradation of their land had forced them to stop cultivating sorghum and they relied on a herd of just a few small ruminants.

After a series of meetings, an agreement was made giving each woman the right to use a one-acre plot inside the fence to produce fodder. The women pledged to contribute to the enclosed land's original purpose and had the opportunity to increase their own income. They began growing a combination of native species and a few recently introduced exotic species. BIRDP supplied kick-start seed and goats to the women, and constructed permanent water harvesting structures to supply the plots. The women were invited to attend training courses on seed collection, extraction and storage, and micro-project planning and management. With the support of BIRDP, the group registered as a legal entity, a step that helped them get financial support and allowed them to further diversify their activities. To avoid any potential conflict, the project also conducted an intensive gender sensitisation programme within the broader community, aimed at encouraging greater levels of women's participation in the community's activities and decision-making processes.

Stronger animals, environment and community

Each woman harvested and stored a substantial quantity of dry matter for fodder after the end of the growing season, to be used

Pooling resources in order to address their most important issues. Photo: BIRDP

during the critical dry months. The fenced land not only benefited the group of women, but became a major source of rangeland seeds for natural dispersion and regeneration, both inside and outside the fence, helping surrounding communities as well. The Local Commissioner was so enthusiastic that he led a campaign to replicate and scale up this initiative.

With access to these plots, the women were not only able to feed their animals: they also fed their families and made an income from selling surplus animals, seeds and fodder. In addition, by cultivating and protecting the fenced land in a well organised manner, the women's social standing in the community has grown considerably. Soon, BIRDP assisted with the formation of two other women's groups, who collectively work on and protect land plots close to their settlements. Traditionally, men in this region controlled all the resources. Now, women in Butana are playing a larger role.

Success factors

By forming a group, the Butana women have been able to share the responsibility of protecting their fenced plots in a socially and culturally acceptable way. They organised themselves in two day-time shifts, allowing the other women in the group to take care of the young children and family elders in their neighbours' absence. Mobile phones were purchased with their increased incomes and this made it easier to patrol the large fenced area. Patrols were made more enjoyable by inviting neighbouring women into the enclosed land for coffee and incorporating a special local rite as part of their daily routine.

The women's knowledge of livestock rearing was especially important, and BIRDP's staff have drawn upon this. Their participation was crucial; they took the initiative and were motivated to cultivate and protect the land. They pooled the resources needed to address the issues that they themselves deemed important.

The earlier, exclusively technical intervention of building a fence, had negligible results. It was not "rooted" in the community. The later efforts were a success because they paid attention to the importance of community organisations and to the role of women within them. The Butana experience demonstrates that collective production of fodder in a fragile environment can help restore natural resources and improve livelihoods and food security. Moreover, it can be a very successful way to empower female-headed households.

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This article is one of the results of a documentation workshop carried out by ILEIA and KariaNet in 2012 in Beirut, Lebanon, which was supported by the IDRC and IFAD. This workshop aimed to strengthen the skills of project staff in capturing, analysing and disseminating lessons drawn from their work in the field. For more information, visit www.ileia.org and www.karianet.org

Farmers around the world are experimenting with strategies to cope with and restore dry and degraded environments. These may focus on tree planting or enhancing soil fertility. The following stories are just a few examples of how farmers in different regions use a variety of techniques to enhance ecosystem resilience and protect their livelihoods.

Kenya

Alternative fodder species

With a changing climate and less rains throughout East Africa, farmers are finding it more difficult to obtain a constant supply of fodder for their livestock. Many of the traditionally used fodder types, such as grass or straw from crops such as maize, are declining in availability. In the Kyuso district in Kenya, a number of farmers are adapting by using alternative, drought resistant varieties of animal fodder that are abundant in arid and semi-arid lands, such as acacia pods, tubers from the *Thurnbegia guekeana* tree, and *Melia volkensii* fruits and leaves. These crops can provide feed throughout extreme drought periods: some can be harvested in the dry period, when many other water-dependant fodder varieties are unavailable.

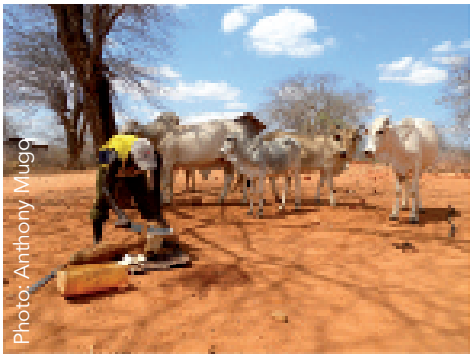
Photo: Anthony Mugo

Acacia pods can be dried and stored for several months enabling farmers to keep a supply of fodder, and root tubers hold a large amount of water, reducing the drinking water needed by livestock. Nonetheless, switching between fodders can still pose challenges for farmers and animals. Also, there are concerns that tubers that are widely available now may become scarce if more farmers start to make use of them. Planting new tubers and raising awareness on sustainable harvesting might be a solution to this and help communities to become more resilient in the future.

For more information contact Anthony Mugo, at ALIN, Kenya, or Donald Inch, at the Scottish Environment Protection Agency. E-mail: amugo@alin.net or donaldinch@googlemail.com

Argentina

Recovering naturally

Around 75% of Argentina is made up of arid or semi-arid lands, many of which are suffering from desertification. One such area is Salinas Grandes, a closed river basin, where different ecosystems meet. The local farmers' main activity is the extensive breeding of goats and cows, which graze on common land. If not properly managed this ecosystem is very susceptible to degradation, particularly from overgrazing. With the support of the Global Environmental Facility, local producers decided to encourage the natural restoration of parts of their land by temporarily excluding livestock by fencing. The vegetation and soil in these protected areas is able to recover, improving the productivity of the pasture in the long term. The recovery process is being monitored, providing valuable information that can be used in areas with similar problems. After three years, major improvements in plant diversity, ground cover and plant biomass have been observed. The rate of improvement varied in different parts of the area, according to the vegetation type, growth dynamics and weather conditions. Farmers found that electric fences are the most efficient enclosure technique: they involve less initial expenditure than traditional wire and branch hedges and are easier to manage. These enclosures are playing a significant role in countering desertification, maintaining ecological diversity and productive potential.

For more information contact Ana Marina del Carmen Contreras, at Red Agroforestal Chaco Argentina. E-mail: anitamarinac@gmail.com


Photo: Ana Marina Contreras

The Netherlands

Regaining the lost soil fertility

The Netherlands is known for its impressive dairy production. Since the 1950s the government has supported farmers, encouraging the highest possible milk yields per animal through specialisation, mechanisation, and scale enlargement. In 1960 the average Dutch dairy cow would produce 4,200 kg of milk per year, in 2007 this had nearly doubled to about 7,880 kg. But the side effects of this strategy have also become clear, including environmental pollution, dependency on subsidies, and a drastic reduction of soil fertility levels. Since the 1960s, more than 90% of all Dutch farmers have had to quit farming. Today, a significant part of the remaining dairy farmers are organised in study groups that aim to find ways to improve soil fertility (and incomes!) by improving the interactions within the animal-manure-soil-roughage cycle. They have discovered that, by applying less artificial fertilizer and concentrates, and by actively improving soil life, more milk can be produced from the grass and silage produced on their own fields. This has both economic and environmental benefits. These initiatives are being promoted by several organisations, including the *Duurzaam Boer Blijven* programme (or "Continue as a sustainable farmer") that supports groups in the Utrecht and Gelder Valley region and elsewhere. While this process is not widely known beyond Dutch borders, this approach to developing sustainable dairy systems could be taken up elsewhere.

For more information, contact Katrien van't Hooft, at Dutch Farm Experience (www.dutchfarmexperience.com). E-mail: katrienvanthooft@gmail.com


Photo: Katrien van 't Hooft

Morocco

Intercultural tree planting

For the last eight years, European students have been going every February to help Moroccan farmers combat desertification during the "Green Day". In the arid zones of Morocco, bordering the edge of the Sahara, the soil and climatic conditions are very difficult. The local population is almost entirely dependent for their survival on exploiting natural resources. Despite numerous initiatives, their economic activities are limited, and agricultural productivity levels are low. For several years, the Moroccan Ministry of Agriculture and the France-Morocco Azzeka Student Association has been working together with different rural communities. Green Day promotes partnership between tourists and visited communities while contributing to the reforestation of palm trees and improving the living conditions of life of disadvantaged rural farmers. On this day of solidarity, palm trees are planted by young students. The financial resources for this operation are mobilised at European universities, while the Moroccan communities prepare the palm tree seedlings and raise awareness locally about the project and the threat of desertification. On the day itself, the planting of date palm trees is accompanied by cultural activities in the surrounding villages around the theme of desertification. The higher number of palm trees helps expand the oases where the villagers live, stabilises and feeds the soil and improves climatic conditions. The project also enhances technical and scientific co-operation between France and Morocco and solidarity between individuals and communities in the two countries.


Photo: Green Day

For more information, contact M. Ali Zahri, at the Ministry of Agriculture (Meknes Tafilalet region). E-mail: alizahri2004@yahoo.fr

Kaluchi Thakarwadi: Rejuvenated landscape, Rejuvenated lives

Kaluchi Thakarwadi is a small, remote settlement in the district of Ahmednagar, in Maharashtra, in the semi-arid zone in the rain shadow of India's western mountains. Rainfall is unreliable, so there is chronic water scarcity, with recurring shortages of food and fodder. Six years ago a broad watershed management programme was established, which has already had an enormous impact: a transformation from desert to a replenished watershed.

Watershed Organisation Trust (WOTR)

Villagers in Kaluchi Thakarwadi depend on agriculture, but only 2 of the 7 hamlets are close enough to the river to be able to use its water for drinking and irrigation. Many of them had to migrate temporally or permanently in search of work in the cities, or as labourers in large plantations. The community lacked the resources or the collective power to tackle the problem of water scarcity and land degradation, and neither government officials nor development schemes had reached this village a few years ago. It didn't even have a road leading to it until 2009.

Then, reports of the impacts of different watershed projects came in from neighbouring villages, and the people of Kaluchi Thakarwadi decided to try a similar approach in their village. In 2005, the local authorities contacted Shree Hanuman Watershed Vikas Sanstha (SHWVAS), a small NGO working in the area, who in turn contacted the Watershed Organisation Trust (WOTR).

A few conditions

WOTR's programmes are designed around the belief that the success of any project depends on the motivation of the community, and on its willingness to take ownership and participate in it. We see a watershed development programme not only as an effective way for fighting desertification, but also as a means for community development and building socio-economic solidarity. But there are certain pre-requisites for a programme like this one to work in any village:

The first is voluntary *shramdaan*, or the labour contribution from every family. As elsewhere, it was initially difficult to convince the people in Kaluchi Thakarwadi of this. Their financial condition being critical, it was natural for them to think only in terms of their own household and in terms of immediate incomes. In addition, the high levels of migration had created a scattered, disjointed community, and efforts were needed to get them to think of themselves as one cohesive unit. So we opted for a strategy that has worked in other places of extreme financial crisis,

An important pre-requisite is the involvement of all groups within a community. Photo: WOTR

combining *shramdaan* with paid labour in order to ensure that the people's daily needs are fulfilled.

A second pre-requisite is the involvement of all the groups within a community. The villagers here live in remote, dispersed hamlets, and do not have much access to information. The villagers did not easily accept our condition that people from all parts of the village, regardless of their status or gender, would come together and participate in the entire process, especially in the planning and monitoring activities. This meant breaking years of socio-economic barriers. Initially, the women did not come to meetings at all. A number of meetings between the organisation and the villagers were needed to gain their trust. Slowly, a few people were convinced of the importance of the programme and helped us convince all the others to join. Bit by bit, women started attending all meetings and getting actively involved in the programme.

The third condition we had to agree to was that of *Kurhad-bandi* (a complete ban on tree felling) and *Charai-bandi* (a ban on open grazing in treated areas). Villagers realised that our joint efforts could only work if trees were protected from the axe and from livestock.

Different activities

The programme started as soon as there was consensus around these pre-requisites. Work began in January 2006, and during these six years it has considered a set of different actions, ranging from the installation of hand pumps to microfinance. Throughout the years, however, it has focused on three main areas:

(a) Soil and water conservation. Watershed "treatments" are important in containing desertification and replenishing degraded lands. Through various different efforts, depending on the lay of the land, running water is made to walk. Slowed down water percolates into the ground, increasing the soil moisture and also raising the groundwater levels. The problem of fertile topsoil being washed away by flowing water is tackled in this way. The treatments used in Kaluchi Thakarwadi were similar to those used in other semi-arid regions where WOTR has worked, and included continuous contour trenches, farm bunds, and also a check dam.

(b) Capacity building. Together with the technical efforts, which were implemented at the farm level, we thought it important to make everyone aware of what a watershed development approach means, and the implications it has. We organised a series of training courses and held meetings with different sections of the village and, based on the principle of "seeing is believing", arranged exchange visits to other districts in the region so farmers could see the positive results achieved elsewhere. This was often a key factor in convincing them to join.

(c) Institution building. Community based organisations (CBOs) are a crucial link between the people and the supporting organisations, and in our projects they are responsible for every aspect of the project. A 15-member Village Development Committee (VDC) was formed, with members representing all the hamlets, the different wealth

	Before the project	After the project (August 2012)
Water availability	For 8 months	For 12 months
Total number of wells	6	10
Underground average water table	30 feet	15 feet
Perennially irrigated land	2 ha, 6 families	38 ha (22 ha of vegetables), 55 families
Seasonally irrigated land	6.2 ha	30 ha
Waste land	45 ha	25 ha
Bajra (pearl millet)	4-5 quintals	10-12 quintals
Kitchen gardens	0	7
Migration	70%, 6-7 months	20%, 3-4 months
Total milk production per day	Insignificant	40-45 litre
Fodder availability	3-4 months from the forest	12 months from people's lands

classes (including the landless), and with equal representation of men and women. Since 2006, the VDC has met regularly to plan, implement and monitor all project activities, and manage the project's finances, with WOTR staff playing only a supervisory role. We also worked with women's Self-Help Groups (SHGs). Forming a SHG is not an easy task in a remote, tribal hamlet like Kaluchi Thakarwadi. Three SHGs have now been operative for several years. They organise a savings programme for women and have also started producing and selling compost, and building and distributing energy-saving stoves.

Broad results Farmers have benefitted greatly from their own conservation efforts. Although erosion levels have not been measured in detail, crop yields show a substantial increase (see table). And the wells that barely filled up in the rainy season now have water throughout the year. This means a second annual crop is now possible. In addition, the check dam has become a permanent source of drinking and irrigation water.

The most evident result of this programme is seen in terms of agricultural production and livestock. But WOTR's Watershed Development Project is designed to rejuvenate much more than a land on the verge of turning into a desert. The cumulative result of this work is also obvious: greater economic prosperity. People can now invest in their homes, their children and their lifestyles. The first television and telephone in Kaluchi Thakarwadi appeared after this project. And the project has empowered the community: the VDC is now strong enough to directly approach the authorities and request access to what is rightly theirs. With the help of WOTR, they have even availed themselves of Caste Certificates which give them access to various schemes applicable to tribal populations. The VDC ensured that these government subsidies reached the village and have installed 15 drip and sprinkler irrigation sets. One of the hamlets has even got electricity as a result of consistent efforts by the VDC.

Rejuvenated lives This is a story of transformation; of how the people of Kaluchi Thakarwadi changed their destiny and their environment from a desert to a replenished watershed. Kaluchi Thakarwadi is no longer a tragedy of inhospitable climate and uncontrollable circumstances. Through rejuvenating their landscape the villagers have rejuvenated their lives.

Watershed Organisation Trust (WOTR) is a not-for-profit NGO founded in 1993 that operates in the states of Maharashtra, Andhra Pradesh, Madhya Pradesh, Rajasthan and Jharkhand. 2nd Floor The Forum S.No. 63/2B Padmawati Corner, Pune Satara Road, Parvati, Pune 411009, India. E-mail: info@wotr.org

A national-level effort

Many different Watershed Development Programmes have been implemented in India during the past 40 years. These include those implemented by Ministry of Agriculture; the Drought Prone Areas Programme, Desert Development Programme, Integrated Wastelands Development Programme (implemented by the Ministry of Rural Development since late 1980s), and also the National Afforestation and Eco-Development Project, implemented by the Ministry for the Environment and Forestry, since 1989. Focusing on the adoption of appropriate production and conservation techniques, these have been successful in their aim to increase the production potential of the dry and semi arid regions of the country. Following a holistic approach, these programmes have helped regenerate wastelands, increase the fertility of the soils, lower erosion levels and contribute to the conservation and better use of the water available.

A number of projects supported by bilateral donors and international funding agencies have been launched since the 1980s. In the Indian context, the importance of these efforts lies less in their overall financial contribution than in their flexibility to experiment with and "pilot" new approaches – a flexibility which government norms and procedures do not easily permit. One of the many cases has been the Indo-Swiss Project on Watershed Development (2003-2004), implemented by the Karnataka Watershed Development Society. Working as a strategic partner, the AME Foundation focused on participatory learning processes like Farmer Field Schools and on the improvement of farm productivity "between the bunds". Many other NGOs have also promoted similar efforts in different parts of country. Projects like Sukho Manjari (on the Himalayan Foot Hills), Haryana or Ralegaon Sidhi, to name just a few, received a lot of attention because they significantly increased the availability of water. These projects paved the way for the formulation of the National Watershed Development Project for Rainfed Area (NWDPRA), which was launched in 1990, and is now being implemented in 28 states. (T.M. Radha)

Grass for carbon

David Millar is the Director of the Centre for Cosmovisions and Indigenous Knowledge in Tamale, Northern Region, Ghana, and Pro Vice Chancellor of the University for Development Studies. E-mail: millarad1@yahoo.com

Within the current debates on climate change, tree planting has received much attention world-wide, and has been a major strategy of the forestry and environmental sectors in Ghana. However, in northern Ghana, there are several obstacles to developing tree planting programmes. First, when arable land is in short supply, it is difficult to set aside land for tree cultivation. This is a major issue in the Upper East region in particular. Even in the Northern and Upper West regions, which have lower population densities, bush fallow periods are getting shorter and shorter, and there are many demands to release land belonging to game and forest reserves.

The annual bush fires make tree planting difficult, as it is almost impossible to protect the trees from the fires. Thirdly, eucalyptus, the major tree being promoted, is non-indigenous and is a "thirsty tree", which has serious implications for ground water availability in an already water deficient region. Furthermore, eucalyptus monocultures reduce biodiversity. Finally, there are several cultural barriers to planting some species of trees. All these factors reduce the opportunities to plant trees in northern Ghana and to take advantage of the "emission trading" provisions under the Kyoto protocols.

In the Upper East region of Ghana, basket weaving is an important income generating activity. The grasses used are obtained from the wild. However, changing rainfall patterns, bush fires and an increasing demand have substantially reduced the availability of the grasses used, to the extent that they need to be imported from other regions. These grasses are particularly tall and can also be used to reclaim wastelands, and can provide the basis for setting the pace and extent of bush fires. For instance, in areas where grasses are used for roofing, burning is often controlled until the required amounts have been harvested by all who need it. This has other benefits, leading to reductions of run-off and improvements in soil fertility, especially when the left-over grasses are left to decompose. Livestock depend on grasses for feed. Grasses can also be transformed into a form of charcoal (briquettes), with large economic benefits. Better grassland management provides an opportunity for northern Ghana to participate in the global efforts to reduce carbon dioxide emissions, benefit from the Clean Development Mechanisms (CDM), provide income generation opportunities and efficiently contribute to the fight against desertification.

Striving for a land-degradation neutral world

Defining "the future we want" for the planet we rely on, world leaders at Rio+20 resolved to achieve a land-degradation neutral world. *Forging a global partnership to reverse and prevent desertification/land degradation and to mitigate the effects of drought in affected areas in order to support poverty reduction and environmental sustainability*, the United Nations Convention to Combat Desertification (UNCCD), one of the three international treaties called for by the 1992 Earth Summit, remains at the core of today's most pressing development challenges.

Mia Rowan

The UNCCD addresses the vital issues of improved productivity of land as well as the rehabilitation, conservation and sustainable management of land and water resources. The 195 Parties (194 countries and the European Union) that have ratified the Convention work together to improve the living conditions for people, especially in drylands, where some of the most vulnerable ecosystems and peoples can be found. It pursues its goals with a bottom-up approach – empowering the people touched by desertification and land degradation to fight it by providing the instruments and building the capacities of local authorities and civil society.

Land degradation comes at a huge cost, and not just to the 1.5 billion people across the planet directly affected by it. The 12 million hectares lost to land degradation annually have the potential to produce 20 million tons of grain – food that would minimise growing food insecurity and alleviate hunger.

"One of the major weaknesses in the current global food production system is the absence of policy incentives in three key areas in food production – women, dryland productivity and proper land-use accounting", said Luc Gnacadja, Executive Secretary of the UNCCD, adding that women make up more than 40% of the labour force, but represent only 3 to 20% of landholders.

The world's drylands – the arid, semi-arid and dry sub-humid zones – make up 44% of all cultivated systems. But land degradation in the drylands and elsewhere is undermining global food production, and with it food price stability. Food production consumes finite water and land resources. Already, 70% of all fresh water resources is used in agriculture. As long as the cost of land degradation and water consumption are omitted in food pricing, food insecurity will likely persist due to speculation about the land available to meet the growing food demand. Mainstreaming the costs of land and water renewal in all food producing would stabilise the market in the long run and enable agricultural producers to take better care of the land.

Successful examples

The successes of small-scale food producers are valuable in identifying key policy gaps and solutions. In Burkina Faso, for example, some communities have not only become more resilient to drought, but are also producing surplus grain through farmer-managed natural regeneration practices and agroforestry. These are land-use practices built on a mix of conventional science and indigenous farming techniques that improve land productivity. Their successes show that there are immediate benefits for households and national and global benefits of food

security to be reaped from mainstreaming sustainable land management in agricultural practice.

In his message on World Food Day in October 2012, Gnacadja explained that land degradation in the drylands and elsewhere is undermining global food production and food price stability. The head of the UNCCD pointedly asked, "How can we sustain stability in food production when the land and soil resources that are the backbone of agriculture are eroded year after year?"

To meet the expected dramatic rise in food demand, we cannot count on agricultural intensification whose production schemes degrade land and soil, destroy ecosystems, have expensive input costs and yields that have stagnated and are increasingly vulnerable to the impacts of climate change. Conversely, production systems based on the intensification of locally available and adapted biodiversity, using local knowledge as well as local ecosystems, have been shown to significantly contribute to reducing hunger, improving livelihoods, protecting and regenerating land, soils, water and biodiversity, enhancing resilience to climate change.

Working together The work of the conventions on biodiversity, climate change and land goes hand-in-hand. Bio-intensive production schemes, such as organic agriculture, agro-ecological agriculture and agroforestry, have a role to play in avoiding land degradation and restoring degraded lands. They could be called "Sustainable Land Management practices applied to agriculture" under UNCCD, or "Climate-Smart Agriculture" under the Climate Change Convention (UNFCCC), and are well established throughout the world.

The Rio+20 outcome to strive to achieve a land-degradation neutral world signals a strong desire to change by avoiding the degradation of land in new areas and by improving the quality of land that is degraded every year. But this intention must be turned into concrete action – a timeline and mechanisms for its achievement are needed. In fact, land-degradation neutral must be among the Sustainable Development Goals to succeed the Millennium Development Goals in 2015 and pursued on the grassroots level by all of us.

Established in 1994, the United Nations Convention to Combat Desertification, a legally binding international agreement linking environment and development to sustainable land management, addresses specifically the arid, semi-arid and dry sub-humid areas, known as the drylands, where some of the most vulnerable ecosystems and peoples can be found. **Mia Rowan** (m.rowan@global-mechanism.org) works as English editor and social media specialist at the Global Mechanism of the UNCCD. The Global Mechanism supports developing countries to increase investments in sustainable land management to help reverse, control and prevent land degradation, while promoting economic and social development.

An approach to funding sustainable land management

The UNCCD established the Global Mechanism (GM) to increase the effectiveness of existing financial mechanisms and promote actions leading to the mobilisation of substantial financial resources to combat land degradation and desertification. Since 1999, the GM has worked with the governments of several dozen affected countries to formulate comprehensive anti-desertification financing strategies, fully integrating them in their development legislation and policies.

These financing strategies are structured, yet flexible, processes that support countries to assemble a variety of sources – domestic, international, public and private – to fund land and natural resource management. The strategies should serve as the foundation for an even wider-reaching policy, ultimately leading to long-term and lasting investment frameworks. Among numerous recent examples, frameworks have been designed and launched in Ethiopia, Guatemala, Viet Nam and Zambia.

In addition to connecting governments with potential donors, the GM facilitates access to innovative opportunities, for example, by encouraging private sector investments or market-based mechanisms to promote sustainable land-use practices, such as compensation schemes, ecotourism and eco-labelling.

Development 3.0: Development practice in transition

Following over a half-century of "technology transfer" and "participation", the paradigm of agricultural modernisation appears to have reached a limit. Directly related to growing concerns over the world's food systems, there is a sense of welcomed change taking place. At the centre lays a commonly neglected resource: the creativity embedded in peoples' daily practices and self-organisation.

Stephen Sherwood, Cees Leeuwis and Todd Crane

Despite growing appreciation for the importance of locally-led change processes, the development "outsider" – be it the technical expert or the externally funded intervention, private industry, or simply "the system" – continues to lay at the centre of policies. Institutions have become self-referential and entrenched in certain problematic ways of thinking and doing. Fortunately, as shown in recent critical reviews, such as the International Assessment of Agricultural Science and Technology for Development (IAASTD), rural development is undergoing increasing scrutiny and change. Where is it going?

Agricultural modernisation

Since the 1950s, the evolution of planned interventions on behalf of the poor and disparaged has followed two general pathways. With the support of private foundations like Rockefeller and Ford, pioneers, such as the plant breeder Norman Borlaug, convinced governments to invest in industrial-era technologies (biotechnology, fertilizers and pesticides), bringing forth an external input, technology-centred model emphasising "technology-transfer" (or Development 1.0). About the same time, non-governmental organisations (NGOs) spearheaded post-World War II relief and re-construction efforts; while churches and religious groups became involved in "capacity-building" tied to the independence movements in Africa and Asia and agrarian reform in Latin America. Over time, NGOs established a school of thought emphasising people- and process-centred approaches, all of which can be described as "participatory development" (or Development 2.0).

Such development discourses are the product of influential socio-technical regimes, in their collective efforts to set agendas and policy. For example, social networks organised around competing interests are generating the on-going debates over the nature of hunger and poverty as a "lack" of production or efficiencies, thereby justifying a call for better technology, such as genetically modified crops or "market chain" innovation. Development 1.0 led to the creation of the national agricultural research and extension centres, as well as of the international agricultural research system. Development 2.0 grew with the rise of rural development

It's harvest time for a farm family in Carchi, Ecuador. Photo: Myriam Paredes

NGOs. These two traditions did not emerge in a social vacuum and, in fact, they continually influence one another. Despite disparate origins, over time they arguably have become part of a common ideology of "agricultural modernisation": market-based production, the intermediation of relationships through money and financial systems, and reliance on exogenous knowledge and technology. While each owns its own ideals of environment and public good, in practice, both Development 1.0 and 2.0 emphasize universal notions of "best practice", rationality, and profit.

While it is difficult to generalise about their short- and intermediate-term effects, people largely agree that Development 1.0 and 2.0 have fundamentally altered the course of global agriculture and food, leading to new forms of land tenure and planting schemes, management of soils, water and seeds, exchange, social relationships and aspirations of rural people and their families. Meanwhile, there is little doubt that agricultural modernisation also has contributed to unwanted outcomes. People across the planet are dealing with associated problems – deforestation, degradation of soils and water systems, erosion of on-farm biodiversity, proliferation of pests, exclusion from markets and rising climate variability – that fundamentally undermine their food systems and well-being.

Development 3.0: Self-organisation

Though the future may seem bleak, we find reason for hope. Despite the tremendous institutional influence of Development 1.0 and 2.0, we do not find pure forms of agricultural modernisation in farmers' fields, homes or communities. Short of romanticising local practice, we see that people, their families and social networks largely work outside the formalised institutional environment of development. As such, peoples' practices continue to be richly nuanced and diverse, where one can find both highly worrisome trends as well as promising opportunities.

In the coming editions of *Farming Matters* we will share experiences from a highly prominent, though commonly neglected third pathway in development: family- and community-level innovation embedded in peoples' daily interactions and practices (Development 3.0). We will present our studies on how people, operating in families and social networks, have managed to creatively forge relatively sustainable and healthy food practices in the face of the seeming hegemony of agricultural modernisation. The crux of Development 3.0 is to approach rural development as something that ultimately emerges from locally distributed and resolved social processes, however tricky and messy, rather than as something that can be fixed. Then, one subsequent institutional challenge becomes the re-thinking of science, policy and professionalised development vis-à-vis the undeniable self-organisation of continuities and change.

While we, as researchers and development practitioners, still struggle to step outside of our own institutional biases and constraints, faced with the pressing challenges of modern social and environmental decline, we agree with others that a fresh perspective on development is urgently called for. Like its predecessors, Development 3.0 is filled with contradictions and challenges, but there is strong evidence that development practice is already undergoing change in the hands of emerging networks of development actors, in particular families and food counter-movements.

Drawing on on-going work in Latin America, our colleagues and we will contribute a series of articles on the richness of peoples' daily practices and show why this social heterogeneity is so central to the past, present and future of agriculture, food and environmental management. Through grounded experiences in families, communities and other collectives, we will explore how, through sheer grit, creativity and flair, people go about their daily living and being. In particular, we will shed light on "positive deviance": those cases where families have generated promising alternatives to the norms of practice in soil and water management, agrobiodiversity, family nutrition, the circulation and sale of products as well as in the shaping of public opinion and policy. The focus on positive deviance is meant to provide a central reference point for understanding how change evolves and spreads through peoples' day-to-day practices and self-organisation.

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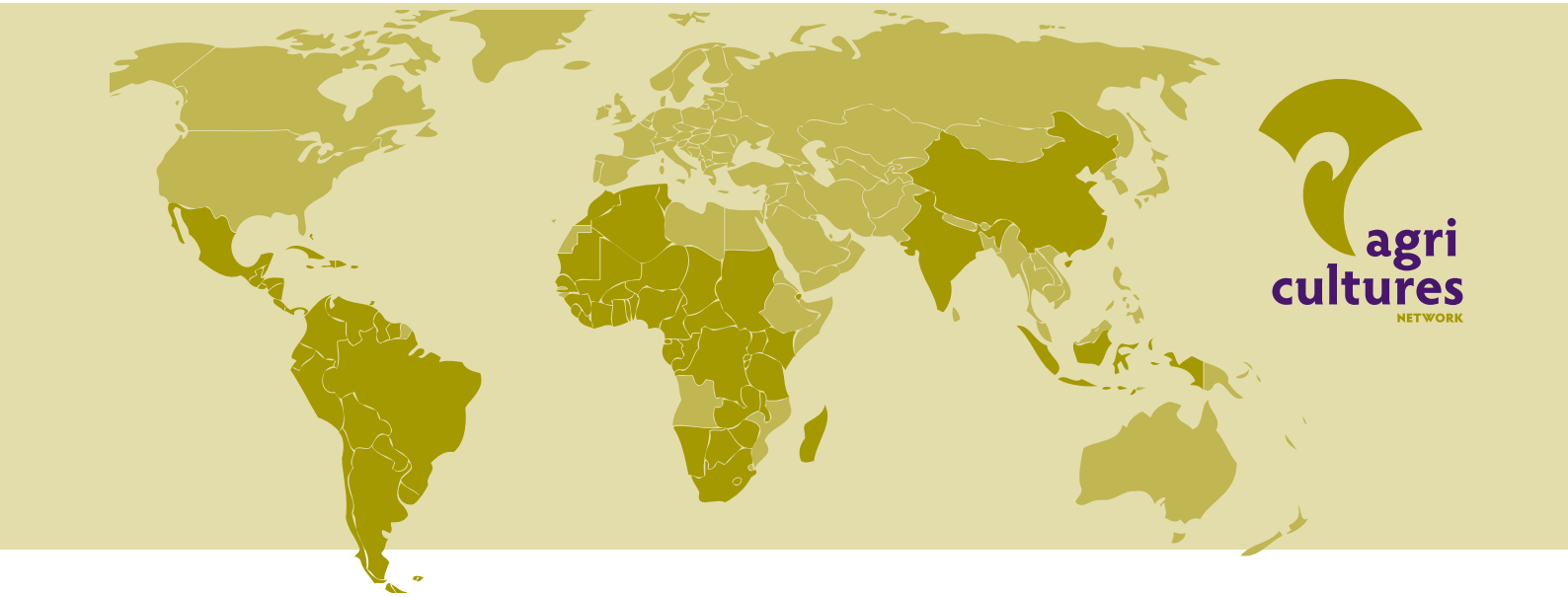

During the past 27 years, our magazines have shown many of the ways in which farmers and organisations are fighting desertification. Combined with scientific knowledge, the approaches based on farmers' ancestral knowledge and inventiveness can make a real difference, helping to conserve natural resources and give high yields. A quick review of the hundreds of articles published by the AgriCultures Network shows some aspects worth highlighting.

Indigenous species and knowledge

Desertification is a global problem, and governments and civil society organisations are increasingly taking efforts to combat it. However, many of the plans and strategies that are drafted simply ignore the traditional knowledge of those living in the world's drylands. Our different magazines have published articles that highlight the importance of this knowledge in the fight against desertification. For instance, in the Philippines, many farmers use indigenous trees and shrubs on or near crop fields, as Blesilda M. Calub showed in an article published on the December 2003 issue of our global edition. "Farmers are easily motivated to plant certain species, such as fodder trees and shrubs that directly address their needs." In the south-western region of the Philippines, selling livestock provides an important source of income for many farmers, so the availability of fodder is very important for them. The use of indigenous trees provides the necessary fodder, and also helps to alleviate degradation. Similar efforts can be seen in Rajasthan, India, where farmers follow traditional agroforestry practices, as described by M. Nagarajan in the *LEISA India* issue of March 2000. Their management involves delicately combining woody components (including trees, shrubs or bamboos) with agricultural crops. One very special species, considered by some farmers as "a foster mother to agriculture", is the Khejri tree (*Prosopis cineraria*). Observation and experimentation has shown that crops grown under the canopy of this tree fare better than those growing under similar conditions without trees.

Soil and water management

The importance of soil and water conservation in drylands can hardly be underestimated. In Brazil's north-

east, which has a dry climate and is experiencing increased levels of deforestation, water access is of great importance for the community. J.A. Soccal's article, published in the March 2000 issue of *LEISA Magazine*, shows how, dissatisfied with "assistentialist" approaches from the government, such as the distribution of water in trucks, the local community enlisted the support of different NGOs and other CBOs (community-based organisations). This led them to develop alternative technologies for managing their water resources, all of them inexpensive and based on local materials and labour. These include building plate cisterns to collect rainwater for human consumption, semi-permeable wells either under or across seasonal river beds or along drainage lines to retain groundwater; and wells that use a simple system of pulleys and pipes. In another article written for *LEISA revista de agroecología* (September 2008), Héctor Leguía described his work with scientists and farmers in Lozada, in Argentina's semi-arid region. Soybean cultivation in this area was causing several problems in the fields, with declining levels of fertility, compression and contamination by pesticides. The scientists worked together with the area's family farmers exploring techniques, built around an agro-ecological approach, to improve the soil and contribute to its conservation. Techniques such as crop rotations and cover crops significantly increased the amount of organic matter in the soil and enhanced its physical properties, which had a direct effect on farmer's yields.

Co-operation

In the April 2009 issue of *Agriculturas*, Carlos Magno Morais presented the work of three NGOs collaborating with farmers in the states of Pernambuco and Rio Grande do Norte, Brazil. These NGOs collected the farmers' opinions and ideas about the effects and influence of climate change in their day-to-day activities, and described and analysed their responses. This led to the publication of documents that have been used in the preparation of the National Action Plan to Combat Desertification (PAN Brasil) and to build farmers' understanding about sustainability. In another article, published in our global edition (September 2008), Paul Van Mele showed the benefits of people working together in Zamblara, a village in Mali. Most inhabitants in this village rely on agriculture and face many difficulties, such as a lack of seeds, credit or water. In 2002 a group of women formed a rice producers' organisation. They approached the Africa Rice Center (WARDA), interested in participating in the training activities under the Participatory Adaptation and Diffusion of Technologies for Rice-based Systems (PADS) project. The group grew from 27 people to more than one hundred, all benefitting from the project's activities which led them to diversify their cropping diversification, a strategy that provided higher yields and incomes. These farmers now grow more rice and manage local resources in a more sustainable way. Equally important is their recognition of the importance of working together. Caste and gender differences are becoming less-pronounced, and the solid partnerships created with NGOs and government agencies lead to better decisions. As mentioned by one of the farmers, "the future belongs to organised people". (HT)

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The editors have taken every care to ensure that the contents of this magazine are as accurate as possible.

The authors have ultimate responsibility, however, for the content of individual articles.

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"DESERTIFICATION MAY BE ONE OF THE MOST SERIOUS THREATS TO GLOBAL FOOD PRODUCTION AND BIODIVERSITY OVER THE NEXT FEW DECADES, AFFECTING AN ESTIMATED 1.5 BILLION (POOR) PEOPLE"

Julia Marton-Lefevre, Director-General of the International Union for Conservation of Nature, reported by Inter Press Service (IPS). India, October 23, 2012

"I am not convinced that a land degradation neutral world is the 'future we want'. In our dreams for the future, should we not strive to improve the current status of degraded lands with the aim of creating a future when our soils are more fertile than they are today? "

Sasha Kramer, Co-founder and Executive Director of SOIL (Haiti) and Winner of the Land for Life Award, referring to the outcome of Rio+20 conference, Rio de Janeiro, 2012.

"The UNCCD should be proud that it has been enshrined in the Rio+20 declaration. I believe that it clears the way for a forward-looking, science-based approach to championing vigorous action throughout the world to regenerate land and soils, and to developing and implementing a sound assessment system for tracking progress. A land degradation neutral world is entirely possible"

Dennis Garrity, UNCCD Drylands Ambassador and Distinguished Board Research Fellow, World Agroforestry Center, after the Rio+20 conference. Rio de Janeiro, June 2012.

"THE SUCCESSES OF SMALL SCALE FOOD PRODUCERS ARE VALUABLE IN IDENTIFYING KEY POLICY GAPS AND SOLUTIONS"

Luc Gnacadja, Executive Secretary of the UNCCD, on World Food Day, Bonn, Germany, October 16, 2012.

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