Agroforestry as an option

Trees and farming

- Co-operatives and land rights
- Multi-layer farms
- Rewards for environmental services
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Tea is one of the agricultural products for which Nepal is famous. It is mostly grown in the eastern part of the country and is exported all over the world. Tea has been grown in the Ilam district since the 1860s, and today, as in the past, many women are involved in the process – usually in picking the leaves. The women who work for large plantations frequently get lower wages than their male counterparts. Yet, things are changing, and women are playing a key role in these changes. In collaboration with the Rural Youth Forum, students at the Institute of Agriculture and Animal Sciences (IAAS) visited the district to analyse the changes which are taking place and to come up with recommendations. They looked at the benefits of specific techniques (like contour farming to avoid erosion) and of other products like cardamom, mangoes, bamboo or amrisho, the “broom grass”. In terms of alternatives, however, their main observations were related to the enormous potential of the area for agro-tourism. Their discussions with women and young farmers in the district showed that many are already benefiting from it in terms of employment and incomes. With more and better services, the IAAS students also discovered why more and more tourists are coming to Ilam.

Text and photo: Roshan Mehta

New opportunities
The TREES experience in São Paulo

The Brazilian projects of Trees for the Future (TREES) try to bring trees back into production systems. By so doing they aim to increase incomes and yields, improve nutrition through the consumption of tree products and restore degraded lands through the introduction of soil conservation measures. Their experience has shown the many benefits of working with groups of farmers.

“Where there are no trees...”

ROPPA, the West African Network of Peasant and Farmer Organisations, facilitates the exchange of information between twelve West African countries. Its president, Djibo Bagna, talked with us about the role played by agroforestry practices in the region, the reasons why farmers find this approach useful for cultivating their land, and the chance of scaling up these practices.

Payments or rewards?

The growing extension of cultivated areas in Africa is one of the major causes of deforestation in the continent. The World Agroforestry Centre is working to develop integrated and intensified agroforestry systems in order to reduce this negative trend. The crucial question concerns the benefits that farmers can get from the implementation of these approaches. Is money the only rewards that they are looking for?

A long term perspective: The Wanakaset concept

Wanakaset is an alternative farming concept that maximises efficient use of natural resources. Developed in Thailand, it aims to make farmers self-sufficient by mimicking natural ecosystem processes. The article explores the important role that trees play within this system and the advantages they bring today and in the future.
Agroforestry is one of mankind’s best hopes to create a climate-smart agriculture, increase food security, alleviate rural poverty and achieve truly sustainable development”, write Dennis Garrity and Paul Stapleton in the theme overview for this issue. Agroforestry can produce impressive results, as several experiences confirm. In a recent (must-read) report, Olivier de Schutter, Special Rapporteur to the UN on the Right to Food, refers to agroforestry successes in Africa. He convincingly argues that a farming system that integrates annual crops, trees and animals, is a highly effective way of dealing with the challenges facing farmers today.

So it is good to see that the number of trees on farms is increasing. Farmers are more motivated to grow trees. An impressive example can be seen in Niger, where the number of trees on farms has increased by 200 million in 30 years, covering a total area of 5 million hectares. Similarly impressive are the tree-growing initiatives of marginal farmers and landless women and men in Bangladesh, who, over the past twenty years have planted hundreds of millions of trees on their homesteads, on farm land and along roadsides.

Yet one thing is crucial in these two and in all other cases: small-scale farmers and landless people will only plant and tend trees if their rights to use these trees are secure. And a lack of rights is not the only possible threat to such “regreening”. The recent surge in large-scale commercial investments in land is leading to a further marginalisation of small-scale farmers and their loss of rights to land and trees. In pursuit of “efficiency”, large-scale mechanised farms can turn vast stretches of land into ecological deserts, with not a tree to be seen.

A recent (and also a must-read) report by OXFAM argues for greater complementarity between large-scale industrialised farming and small-scale, low external input farming. Can we envisage a future where large and industrialised farms embrace agro-ecological principles, and small farmers share the responsibility of regreening the environment – and share the benefits?

Edith van Walsum, director ILEIA
AGROMISA PUBLICATIONS: PRACTICAL AND COMPREHENSIVE

Agromisa Foundation focuses on small-scale agriculture. Its practical publications in the Agrodok series are available in English, French and Portuguese and are published in cooperation with CTA (The Technical Centre for Agriculture and Rural Cooperation). Titles such as Fruit growing in the tropics; Erosion control; Non Timber Forest Products Agroforestry and the Propagating and planting of trees deal with the relationship between trees and successful farming. Agromisa also publishes an on-line AgroBrief: Fodder trees. For information on Agromisa publications visit www.agromisa.org.

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Youth and farming 1
The “Youth and Farming” edition illustrated the importance of the next generation. I’m really glad that ILEIA has brought this issue to the surface. Rural young people have the wisdom to manage the future of agriculture. They sense that agriculture is not only economic but also social, cultural, and spiritual. This is something that urban people and investors lack. Agricultural education is the ultimate way to ensure that young people take an interest in agriculture. This education should be holistic and depart from the wisdom of local people and the resources that they have. Young people believe in this kind of education. This was for example shown in the article on “Youth’s perception about sustainable agriculture”. It is quite obvious that agrarian development cannot be achieved simply by giving out inputs and credit. It is important to build a correct way of farming and ensure capacity building among the farmers, villagers and young generation – as described in the article about the Pacific youth. With all of this knowledge, I am sure that agriculture will be innovative, commercially viable and guarantee the livelihoods of many people and the environment.

Hendrikus AM Gego, Field Co-ordinator, VECO Indonesia

Youth and farming 2
I must confess that “Farming Matters” has been very useful to me, to the members of YOFADEG and to the rural communities where we operate. We have this magazine in our library, where farmers come to read it. We found your March issue particularly interesting as it relates to what we do: we work with youth and children and encourage parents to teach their children agriculture. We have been creating environmental clubs in primary schools and colleges. We also encourage youth to get involved in agricultural activities, working against the commonly-held idea that agriculture is for the poor, the elderly, and that the underprivileged should be wiped out. We encourage primary schools and colleges to pay attention to agriculture as this will help children and youth develop their interests. The youth are ready to work. Let the government, stakeholders and donors examine the needs of agricultural communities and the world will be free from hunger within a very short period of time.

Emmanuel Ngenge Ngoh, President, YOFADEG – Young Farmers Development Common Initiative Group, Nkambe, Cameroon

Bad governance
Is there a link between bad governance and small-scale farming? This is a question that recently came to my mind. The fact is that small-scale farming has not managed to bring the masses out of poverty, but only manages to give rural dwellers a pittance to survive on, while they are expected to feed the nation. Advocating them may only be a way of clinging to power. In fact, there is a clear link between small-scale farming and poverty. Maybe the best solution is to have a broad based economy so as to lift the burden of sustaining rural livelihoods and ease the pressure of over reliance to small-scale farmers. Seemingly, small-scale farming also thrives where there is considerable commercial farming.

White Mvula, Harare, Zimbabwe

Land ownership
It’s gratifying to note that we still have people who are going out of their way to help the disadvantaged in our society. The northern part of Uganda is the least developed but potentially the most suitable area for commercial farming. The land is communally owned and, alongside the war that has afflicted the region, this type of land tenure has contributed to poverty in this part of the country. There is no access to credit because of lack of collateral. The big challenge for stakeholders is how to utilise land that is idle in rural areas without prejudicing the rights of rural populations. There is a need to ensure that legal empowerment does not turn out to be an impediment to economic development!

Muhimbise John, reacting to the blog piece titled “Local power against global land rush”

More ICTs in Africa
I read the article on ICTs in Africa with a lot of interest. I have been working with the Ministry of Agriculture in Kenya and have now retired. We wrote a project proposal with a very similar kind of idea, about using ICTs and information exchange as a tool for adapting to climate change, and submitted it to FAO. If we get funding we would want to know more about how a Maarifa Centre works, as we intend to use the same approach. Thank you for your very informative article.

Thomas O. Opondo, Ukwala, Kenya

Farming Matters welcomes comments, ideas and suggestions from its readers. Please send us an e-mail to ileia@ileia.org or a letter to our new postal address: P.O. Box 90, 6700 AB Wageningen, the Netherlands.

OUR READERS WRITE
The size of the world’s forests is declining every year and yet, at the same time, the number of trees on farms is increasing. Over a billion hectares of agricultural land, almost half of the world’s farmland, have more than 10 percent of their area occupied by trees. Over 160 million hectares have more than 50 percent tree cover. Agroforestry, mixing trees with agriculture, is a crucial bridge between forestry and agriculture. Growing trees on farms can provide farmers with food, income, fodder and medicines, as well providing environmental benefits such as enriching the soil, retaining water, fixing carbon and generating biomass.

Over the next two decades, the world’s population is expected to grow by an average of more than 100 million people a year. More than 95 percent of that increase will occur in developing countries, where pressures on land and water are already intense. A key challenge facing the international community, as well as local institutions and farming communities is, therefore, to ensure food security for present and future generations, while protecting the natural resource base on which they depend. Trees on farms will be an important element in meeting those challenges.

Farmers in many parts of the world are enthusiastically incorporating trees into their landscapes as the benefits of doing so become clear. Data from the Food and Agriculture Organization show that the number of trees on farms is increasing, even as the amount of forests is decreasing. In some regions, such as Southeast Asia and in Central America, tree cover on agricultural lands now exceeds 30%.

**Multiple benefits from working trees** Agroforestry focuses on the wide range of useful trees that can be grown on farms and in rural landscapes. These include “fertilizer trees” for land regeneration, soil health and food security; fruit trees for nutrition; fodder trees that improve the production of smallholders’ livestock; timber and fuel wood trees for shelter and energy; medicinal trees that combat disease; and trees that produce gums, resins or latex products. Many of these trees are multipurpose, providing a range of benefits.

Agroforestry provides many livelihood and environmental benefits, increasing the assets of poor households with farm-grown trees, enhancing soil fertility and livestock productivity on farms, and linking poor households to markets for high-value fruits, oils, cash crops and medicines. Domesticating wild fruit trees, such as the African plum (*Dacryodes edulis*) and the bush mango (*Irvingia gabonensis*), using simple, sustainable technologies like nurseries, soil fertility management and domestication programmes, has allowed smallholder farmers in Cameroon to increase their earnings fivefold. Similarly, a massive communal move to plant poplar trees in irrigated wheat and barley fields in northwest India now supplies 50 percent of the country’s pulp and paper industry. Both cases show the importance of a group effort, in the same way as Jeff Follett’s article from Brazil.

**Policy, land rights and ownership of trees** Yet, the contribution that trees can make on farms is strongly influenced by governance institutions, policies and rights. Trees are
Taking the results of a large number of studies (see http://tinyurl.com/6957366), we can confidently say that a tropical tree sequesters at least 22.6 kg of carbon from the atmosphere each year and in many cases much more. Most of the deforestation in Africa, and in parts of Asia, is caused by agricultural expansion, largely by smallholder farmers. Agroforestry can curb emissions of greenhouse gases by slowing the conversion of forest to farm land and holding carbon in the trees on the farms. Developing smallholder agroforestry on land that is not classified as forest could capture 30-40 percent of the emissions related to land-use change.

The long-term perspective
A long-term perspective is essential to meet the future challenges that increasing population will bring, especially that of increasing food supply from a diminishing area of available land. In the longer term, the emerging Evergreen Agriculture movement, which looks to reinvent agriculture trees in a radical, but entirely practical, way, is a vision of a future in which many food crops will be grown under a full canopy of trees. Evergreen Agriculture is doubling and tripling cereal crop yields in many parts of the African continent. The indigenous nitrogen-fixing tree Faidherbia or Acacia albida is increasing unfertilised maize yields in Malawi, Zambia, Tanzania, Ethiopia and in numerous other countries. They are now being grown on over 5 million hectares of crop land throughout Niger.

The value of trees outside (as well as within) forests needs to be recognised by all involved in agricultural production, planning and policy development. Greater investment is needed in giving farmers land rights and ownership of the trees that they nurture and in supporting smallholder farmers to adopt agroforestry practices. Such support needs to include access to inputs, sector development of tree planting materials, information and training and access to credit – so that farmers can improve their incomes and ensure food security while also providing environmental benefits. Innovative approaches are urgently needed which balance environment and development needs. In between forest and agriculture, and complementing them both, agroforestry is one of mankind’s best hopes to create a climate-smart agriculture, increase food security, alleviate rural poverty, and achieve truly sustainable development. This, in turn, will help ensure that our world’s forests can be conserved far into the future.

Dennis Garrity is the Director General of the World Agroforestry Centre in Nairobi, Kenya, and Paul Stapleton is the Head of Communications. E-mails: d.garrity@cgiar.org, p.stapleton@cgiar.org

Capturing carbon and cutting the emissions of greenhouse gases. Photo: ICRAF

Sequestering carbon
The United Nations declared 2011 as the International Year of Forests, emphasising the role of forests in the climate change agenda and building on several years of policy progress for Reducing Emissions from Deforestation and forest Degradation (REDD+). Agriculture can reduce emissions, but so can trees in agricultural landscapes. Agroforestry blurs the agriculture-forest divide. However, climate change policies and emerging institutions perpetuate this divide, creating separate rules and incentives to govern each sector. This hinders the potential of agroforestry to play its full role as a major part of the solution to climate change.
The TREES experience
in São Paulo Brazil
For over twenty years, Trees for the Future (TREES) has worked with communities around the world to integrate trees into agricultural production. Our staff has seen the impact that deforestation has had on people and the environment, including a decline in agricultural production as well as increases in diseases, the use of expensive inputs, erosion, landslides, polluted waterways and more. By bringing trees back into production systems, our projects help restore degraded lands and improve people’s lives. To reach these goals, we provide agroforestry training; seeds of multi-purpose, fast-growing tree species; technical assistance and project guidance. These are the main components of our work in Brazil.

Four communities When we started our work in Brazil in 2008 we went to meet small-scale farmers’ associations and agricultural co-operatives to assess their interest in agroforestry. Because of the Federal Government’s ongoing initiatives to restore forest cover, many people were instantly interested. They liked the idea of planting trees that met the requirements for reforestation and that could be used for purposes such as feeding cows and reducing erosion. We started by working with several honey producing associations and agricultural co-operatives. But despite being part of an organised association or co-operative, most farmers were geographically isolated, and this made it difficult to conduct workshops, to provide regular assistance and get the participants to exchange information.

In 2009 we decided to work with associations that are more community-based, rather than the larger and more geographically dispersed groups we worked with in 2008. We chose to focus on four communities within the state of São Paulo. Three of the communities (Guaranta, Promissão Reunidas, and Promissão Dandara) are Landless Movement Settlements, while

We enjoy our individual interactions with farmers and often develop personal relationships with each one of them as they proceed through our training programmes, but we have found that we are more successful when we work with groups of people who want to develop agroforestry projects. It is more efficient to work with groups. It also maximises our use of limited funds by ensuring that workshops and field visits reach the largest number of people possible.

Text: Jeffrey Follet
One community (Arco Iris) is an Indigenous Settlement. All of the communities can be reached by gravel road and each has a small town centre (of less than 35,000 people) within 20 kilometres. They are all approximately 400 km from the city of São Paulo. We work with between ten and one hundred individuals in each community; in each of the four communities there is a history of people working together to accomplish specific goals, such as gaining land titles. We have found that this community spirit improves their personal relations, as well as with our organisation, and has led to excellent project results. Community members identified the production issues that they wanted to address by starting agroforestry projects. In each case, our team worked with individuals to identify techniques and species that would improve their production systems. The main project objectives in these communities are increased and diversified production, reduced erosion and improved water availability. Each individual chose fast-growing, multiple-purpose tree species to plant in windbreaks, live fences, and fodder plots, as well as along waterways and in private forest reserves.

More than proximity A sense of community has shone throughout the development of our projects. Over the past three years we have found that the percentage of people who successfully transplanted their seedlings was related to their proximity to one another. We believe this relationship is due to the number of times that our technician can visit each individual (important in light of our limited resources and staff). The smaller the participants’ properties and the closer they are to one another, the more often they receive visits. During these visits, our technician provides important information on issues such as how to ensure the survival of seedlings. The regular visits also provide an incentive for people to follow through with their tree-based projects and convince them that we are a reliable partner. The importance of working with a group is evident since individuals hold each other accountable for completing our training courses. This was seen during a recent site visit to Guaranta, when our staff arrived at the house of Cida and Zezão. Members of three families sat around their table reviewing the training materials and discussing specific questions. When asked why they were reviewing the materials they stated that they knew the community could only go forward with the project if most of them completed the course. They wanted to be sure that they had all fully understood what we were all talking about. Sometimes we find it difficult to reach individuals within the communities during site visits. In these situations, we can rely on other community members to help us distribute seeds and information. They also provide updates on who is having trouble with their nurseries and can direct us to people who have specific questions. We have found communication and the co-ordination of the projects to be much more efficient and effective as a result of the tight bond found among the project participants.

Other benefits

There are many advantages of working with organised groups. There are several government programmes (like Bolsa Familia and the Direct Local Purchase programme) that purchase products from communities. As agroforestry improves production, working together helps these communities sell a higher quantity of quality products. Larger issues such as the reforestation of waterways and legal reserves also benefit from a community approach. Although each agroforestry project is an individual effort on private land, it would be harder to address these larger issues if everyone was only working individually. Through working with a group we can help co-ordinate efforts to ensure that we take a landscape approach and that individuals do not have a negative effect on each others efforts. For example, if we work with a group of people with land within the same water catchment, this will have more effect in improving the quality of the water. If we only worked with one individual, the benefits of the effort could be offset by another person’s unsustainable land management practices.
their work, have been essential in the growth of our programme. When we met with people in these four communities one of their greatest complaints about agricultural projects was that an extensionist might show up once in the community, hands out materials but then never return to see how things develop. Our field staff have been absolutely crucial in alleviating fears about the commitment of TREES to these communities. People see our technician visiting every week or two and understand that we consider ourselves to be part of the community effort to address economic, social, and environmental issues. We often hear people joking with one another about not completing the next step in the project. Part of that joking usually includes a reference to our staff visiting the community and how bad it would look if they were lagging. It is apparent that there is a certain level of social and peer pressure which helps ensure the projects are completed. Not long ago, an official from the government agency responsible for landless settlements in São Paulo attended a TREES presentation. He did not believe all of the results that had been presented so he went to visit individuals in Guaranta. To the official’s surprise, the community confirmed that we had assisted them by helping to plant trees. In the 2010 nursery season almost one hundred project participants transplanted approximately 120,000 seedlings to diversify their incomes and improve yields, improve nutrition or conserve soil and water. In early 2011 participants direct seeded another 340,000 plants for agricultural production and 70,000 plants for conservation. Our relationship with participating communities is essential in enabling us both to achieve such positive results.

**Putting principles into practice**

We have found a direct relationship between the proximity of people, the strength of a community and the success of agroforestry projects. Our organisation’s relationship with communities and the resulting trust has increased our ability to reach people and to work toward improved agricultural production, increased conservation and enhanced nutrition. There is a tendency for projects to get more impersonal as they increase in size and become more geographically dispersed. In response to this, we are currently working on ways to apply our community-based approach as we expand to new areas. Constant contact with communities through field visits creates an environment for open communication and will produce a feedback system that allows communities to guide the projects. Being part of the community allows us to identify risks and make appropriate adaptations to ensure that people’s needs are met and that we build upon the motivation of the people with whom we work.

Jeffrey Follett works as the South America Programme Officer in Trees for the Future. E-mail: jeff@treesftf.org. More information about their work can be found on their website: www.plant-trees.org
INTERVIEW > DJIBO BAGNA

“People need to have trees on their fields”

ROPPA, the West African Network of Peasant and Farmer Organisations, was founded in 2000 as a representative body that would help “make the voices of family farmers heard”. Having been involved with farmer organisations for decades, Djibo Bagna serves now as its President.

Interview and photos: Frank van Schoubroeck
Ten years after it was set up, ROPPA is now an effective platform for the exchange of information between twelve West African countries. Apart from its regular activities (such as its training programme), it organises ad hoc meetings like the one held a few weeks ago in Niamey, where representatives from each country looked at the regional agriculture programmes and discussed their role in terms of improving the availability of inputs, the quality of seeds, extension and support services and the processing of products for regional and local markets. Special attention is thus given to the role of supra-national blocks and programmes.

What does the West African Economic Community mean to farmers? Policies for agricultural trade vary widely in the region. Most producers favour the free movement of agricultural products and they don’t think it is a good idea if one country protects its markets and another allows free movement. But we don’t have a free market, like in Europe. There are countries that are open to imports and others where the police randomly stop products at the border, which is very frustrating to farmers and traders. You must also realise that there are complementary regions in West Africa. Semi-arid or arid regions are excellent meat producers. Other regions are tropical and humid and can produce irrigated crops. The free movement of agricultural products could help feed the population of West Africa.

In our workshop we discussed how to overcome the different approaches seen in different countries. Our work is made more complicated because the producer organisations are very different from country to country. In countries with many resources, producer organisations are strong and help making policies more consistent, while in other countries there is little attention paid to local dynamics. There is no consistency between the policies of different countries in the region, so it is ROPPA’s task to help exchange information and harmonise such policies.

Is agroforestry a priority for ROPPA? Sustainable land use is our priority, and we see agroforestry as part of the good management of natural resources. The climate is changing and all producers have to re-think their practices. It is clear that deforestation and the expansion of the Sahel are continuing. There is plenty of evidence showing that genetic diversity is diminishing: with climate change affecting our region, we risk losing thousands of trees that are well-adapted to our context. Agroforestry can be a key component for the necessary diversification of agricultural practices.

But why haven’t farmers adopted agroforestry at a large scale? There is a historical reason why farmers have not taken up agroforestry. Policies for the management of natural resources used to be bad. The national forest services had the role of protecting trees, and they forbade farmers from utilising trees as they had done in the past. Farmers were even jailed when they used trees growing on their own land! The forest services appropriated these trees with little respect for farmers’ properties. This led farmers to become hostile to trees and they cut down every single tree to avoid any hassle with the forestry services. Today, we must explain that the tree belongs to the people on the farms. And more and more people understand that there are many benefits of having trees on their land. They need only a little coaching to follow agroforestry practices and in some countries, such as Niger or Mali, this is being practiced at a large scale. Even in some coastal countries you see the development of agroforestry.

Could agroforestry take over timber production from forests? Of course! There is not much forest left in West Africa and agroforestry will take over the production of firewood and wood for construction. Most of the wood you find on rural markets is grown on farms. There are also international markets for wood. It would be a good idea to serve global markets with wood from agroforestry. Of course, it takes time to grow timber. I know that there are some places where they already grow timber for the market. Yet this is work in progress. We must develop family-farming based agroforestry systems that can produce timber which is adapted to the needs of the international market.

What is the role of pastoralists in agroforestry? Today there are many pastoralists who start farming. They plant leguminous
tree species for fodder. For example, there are camel herders who plant trees that their camels can eat and they subsequently settle down. That is a profound change in their lifestyle. Like all agriculture producers, pastoralists are being forced to change their activities. The underlying cause is climate change, which is turning our world upside down. People tell me every day how climate change affects their livelihood: rains come rarely or stop in the middle of the growing season, fields become barren and, sometimes, major flooding occurs. Complete villages were washed away in Niger last year and the river uprooted big trees. For us, climate change is actually very practical and affecting all our lives.

How do policy makers respond? The reality in West Africa leaves us no choice. It’s not like in other countries where they have oil or gas or something else to live from. ROPPA fights for the preservation of natural resources and we think that people need to have trees in their fields. It is clear that we need policies that support agroforestry: where there are no trees, the land is barren and unproductive; where there are trees, there are opportunities to grow. Most countries have formulated a National Action Plan for Adaptation to Climate Change. Agroforestry plays an important role in such plans. We must work at a very large scale. There are several options for organising this. The initiative may come from us, as producers, but it may also come from research, or from governments. In any case, all the actors should be involved and develop their own specific roles.

What is the role of African traditional leadership in natural resource management and agroforestry? The role of traditional leadership differs according to local traditions. There are chiefs who only play the role of a social authority, and others have authority over land. Some are the guardians of tradition, and others the guardians of social relations. Chiefs with authority over land can also determine if a tree belongs to a farmer or not. In fact there are many chiefs at many levels, from local to national level. All play a role in agricultural development and land preservation. Traditional chiefs can be very helpful, but they can also be dangerous for development. They can organise the people, but they can also stick to traditions and block necessary changes. There are some leaders who are very powerful and don’t have the inclination to work for development and the people suffer. There are other leaders who are sensitive and organise people in groups and development is possible under such chiefs. Projects should facilitate the constructive role of traditional leadership, particularly with reference to land tenure.

And what can landless people do? Everywhere there are people who have no land, who cannot produce and who are extremely poor. This situation is extremely difficult. Therefore we have to make reforms and work to empower family farmers. You know, these days land is becoming scarce. If everybody wants to remain members of the big ‘agricultural family’, it is very important that we diversify. For example, some people might remain as food crop growers and others breed cattle. Others still might engage in irrigated agriculture or horticulture and produce for the urban market. Others will engage in processing food products, while others will sell agricultural produce. Agroforestry is yet another branch in the farming family’s activities, and the nice part is that it is synergetic and complementary to food production. In the Sahel, trees do not need watering but help to create better climatic and soil conditions for food crops. You can conclude that if we see farming as a set of different activities, you don’t need land to make a living.

What advice does ROPPA have for projects interested in agroforestry? There is no doubt that we have to stop the degradation of natural resources by encouraging small farmers to practice agroforestry. Projects can document all the benefits of agroforestry for family farmers, the production of raw materials for industry and its benefits at a time of climate change. Projects need to keep strong links with others all so that we know that what they are doing makes good sense for the people on the ground. Given the opportunity, family farmers have the ability to restore land and develop the economy of West Africa.

More information
Please visit www.roppa.info for more information about the network.
Because of its growing demand for inputs and energy, it is increasingly evident that the Green Revolution approach is environmentally unsustainable. But also, and most of all, it is unsustainable because it has an inherent tendency to reduce biodiversity. It is not just a coincidence that the degradation of different Brazilian ecosystems is directly related to the advance of monocultures and the use of chemical inputs, along an ever-expanding “agricultural frontier”. While the destruction of our ecosystems began 500 years ago, there is no doubt that the greatest damage has occurred seen since the “modernisation process” started in the 1960s.

Figures recently released by the Brazilian Ministry of the Environment are alarming, and contradict reports published by many other organisations. The Pampa Gaúcho, in the southern state of Rio Grande do Sul (which borders Argentina and Uruguay) has already lost 54% of its original forests, mostly as a result of the new soybean farms, livestock, and, more recently, the large-scale plantation of trees for pulp. The Brazilian Cerrado, with a total area of more than 2 million km², has already lost 48% of its original cover. The changes seen in the states of Maranhão, Tocantins and Bahia show the enormous impact of the soy industry, with 85,000 km² lost between 2002 and 2007. The same has been seen in the Mata Atlântica, where the production of ethanol has led to a loss of 75 percent of the forested area. The government has frequently mentioned positive trends in the Amazon region, yet the figures released show that the loss rate of forested areas in the state of Amazonas actually grew by 91 percent. Upward trends are also reported for the states of Rondônia and Maranhão.

Notwithstanding this bleak picture, the Brazilian Minister of Agriculture had the affront to say, in an interview last March, that the intensification of agriculture in areas like the Cerrado “does not have any environmental impact”. The Brazilian authorities feel able to continue supporting the current policies of producing and exporting commodities without any worries. Yet, considering how much we are losing in terms of forests and biodiversity, there is a lot to worry about and, during this International Year of Forests, very little to celebrate. Only those behind these policies are celebrating. We should ask them if they’ll continue celebrating in a few years when even more has been lost. I am starting to worry for my grandchildren.

Francisco Roberto Caporal, lectures at the Federal Rural University of Pernambuco, Brazil. He is also President of the Brazilian Association of Agroecology
Email: caporalfr@gmail.com

An incompatible approach
Aiming to increase the area covered by forests, programmes like the Green India Mission are looking for the necessary funds and resources to help them reach the objective of reforesting millions of hectares. Yet money is not the only difficulty. For who owns these new forests? And who benefits from them? Setting up co-operative forests has many advantages, but they can suffer from an incomplete legal framework.

Text and photos: Sudhirendar Sharma
A forestry initiative The Indian Farm Forestry Co-operative (IFFDC) was established by the Indian Farmers Fertilizer Co-operative (IFFCO), one of the largest fertilizer co-operatives in the country. Since its inception, IFFDC has promoted farm forestry as a way of regenerating wastelands. Their main interest was a model which would emphasise and help increase the role of the local community in managing and regenerating wastelands. The adoption of a co-operative model for forest farming was therefore the obvious choice, considering that
• co-operatives have a legal status, and are not subordinate to the government;
• co-operative institutions are both economic and social entities, not mere charitable trusts or social clubs where members participate in social or recreational activities;
• the members are the owners: they have rights and responsibilities associated with electing directors and with giving general direction to their organisation;
• there is clear involvement of the members and this influences decision-making;
• the membership is diverse;
• their success depends on the efforts of their members, their mutual solidarity, their trust in their leaders and on their willingness to make sacrifices.

Another concern was how to achieve similar advantages to those provided by other models. Sacred groves are wooded areas that have existed for a very long time (in most cases dating from before the laws of the country were drafted). They are currently “socially protected” and are left undisturbed. In contrast, “joint forest management” programmes are agreements between a state’s Forest Department and local village forest committees, which give communities the right to extract non-timber forest products. The co-operative farm forestry model is somewhere between the two: communities revere the forests, like sacred groves, yet also pursue economic activities based on the extraction of non-timber products and mature trees. Besides such products, the farm forests provide clean water and air, while the teak, eucalyptus, neem and bamboo farms also support animal biodiversity. But as an institutional
innovation to generate and protect woodlots, farm forests still face a few unresolved issues.

Supplementing farm income

The first of these issues concerns the expected benefits. Although intangible benefits are acknowledged by some co-operative members, farm forestry on degraded lands has been promoted as a strategy for supplementing the limited income which farmers get from agriculture, integrating forestry into their regular farming practices. The way in which individual farming households are profiting varies as the schemes have been established on land under different forms of ownership. Farmers in Rajasthan used panchayat land (common land at a village level); in Uttar Pradesh they used individually owned plots and in Madhya Pradesh state-government-owned lands. The commercialisation of different products (such as firewood) has meant that co-operative members are being paid for their efforts, and in some cases it is heard that the forestry co-operatives “have come to the rescue of the poor”.

In the districts of Sagar, Tikamgarh and Chhattarpur, in Madhya Pradesh, the total amounts which are reaching farmers are considerable: a total of 900,000 rupees, or US$ 20,000 for one year. The income from 6,251 hectares of afforested land has been shared equally between the 3,237 members. Yet, the net gain received by each member is not much, nor has it risen with time. This has led to brewing unrest amongst a large number of members, all of whom supposed that, once the woodlots were mature, they could share the benefits of the timber and that this would considerably increase their annual incomes.

Lack of clarity over ownership

Linked to these problems there is a second issue to deal with. The Forest Department and the forest co-operatives don’t always agree on who is the legal owner of mature trees. The Forest Department has been proclaiming ownership in some locations, and the current Forest Act prevents the co-operatives from selectively felling trees from non-forest lands. Similar uncertainties are also found within each co-operative, as seen in Jaswant Nagar, a village in the district of Tikamgarh. It has a 92-member Primary Farm Forestry Co-operative Society that has been allotted, on lease, 314 hectares of government land. Over the past seven years, over 204,000 trees of different species converted the abandoned land into a dense patch of forest. But only a few weeks ago, the stillness of the night was shattered as many an axe fell on the woodlot. A group of a hundred people was felling the trees indiscriminately. By dawn, the felled wood was hidden in people’s cowsheds and the eaves of their houses. The power-struggle between two factions in the village triggered one of them to cut down all the trees, and although everyone knew who was behind it, no one would utter a word for fear of retribution. Eighty women members of the co-operative society had the courage to complain and bring matters to the police, but the damage had already been done, and the forest co-operative is on the verge of collapse.

Risks and rights

This case is far from unique. Forest farms on previously bare land create a considerable economic value. It is therefore important that legal tenure rights are clearly defined beforehand to prevent conflict. Before initiating forest co-operatives it is thus important to assess if the group has (or can have) the legal right over the capital value of the trees on the land. Who is a legal member of the group, and how can this member claim his or her forest shares? The contribution of tenure rights is best shown by a practical example from another state. In the early 1990s, the Forest Department in Haryana decided to lift the ban on felling and selling a few fast-growing tree species. Farmers started planting poplar trees along their fields. Within ten years, Haryana has become a centre of plywood manufacturing with an estimated 50,000 trees being brought to the market every day. Farmers and the environment benefit accordingly.

Projects and programmes around the world are finding ways to compensate farmers for the services that trees can bring and the co-operative model is showing clear results. It is also showing, however, that farm forests are still constrained by existing laws and regulations. Disappointingly, programmes like the Green India Mission do not yet acknowledge the role of forest co-operatives in increasing the presence of trees on non-forest lands. In the coming year, the forest co-operatives will demand recognition of farm forestry and the provision of a legal and institutional framework that can help them scale up and replicate their initiatives across the country.

Sudhirendar Sharma (sudhirendarsharma@gmail.com) works at The Ecological Foundation in New Delhi, India and researches and writes on environment and development issues. The author wishes to thank and acknowledge the inputs from Dr H.C. Gena, Project Manager, IFFDC, New Delhi, for his help in writing this paper.

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CALL FOR CONTRIBUTIONS

Land and land rights

Land is a scarce resource. Large-scale land acquisitions by governments and companies – also known as “land grabs” – allow them to secure food supplies or simply make a profit. The current and impending food crises are increasing pressures on the ownership of land and its use for agriculture. What are the implications of this for family farmers? Land grabs cause large scale migration, poverty and conflict – not to mention environmental impacts. Biodiversity decreases when small family farms are replaced by mono-crops treated with pesticides and fertilizers. Small-scale farmers have little power to farm sustainably if they don’t have control over land: secure access to land is a prerequisite for farmers to invest in sustainable agriculture. Land grabs give rise (directly or indirectly) to other issues, the rights of pastoralists, ethnic or political conflicts, and can also threaten protected areas.

The key question is: who has the rights to land, or to determine what happens to it? In some countries, the central government is the main decision making authority over land issues, while in others this control is delegated to local authorities, or traditional leaders. Land policies can undermine collective land management, as land is divided up and allocated to individuals. Farmers are often excluded from land planning processes: they are overruled by local leaders or removed from their land without warning. Also among farmers, some have more access to, control over and rights to land than others. Minority groups, for example, including the indigenous population, often have less power over land. The same is true in many societies for women, who have less influence when it comes to decision making and ownership. How can (all) farmers be included in all decision-making processes?

We welcome your suggestions and contributions in the form of articles, photographs, contacts of people with expertise in this area or ideas for other topics you think should be addressed. Please write to Jorge Chavez-Tafur, editor, before September 1", 2011. E-mail: j.chavez-tafur@ileia.org

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Going local

Markets for the poor

The idea behind focusing on export markets is that building direct links between smallholders and big business can cut out the middle man and deliver better prices to farmers.

The trouble with exports But too often, this approach ignores the important role that many products play in local economies. Speaking at the provocation, Harm van Oudenhoven, co-ordinator of the Tropical Commodity Coalition, said that in Nicaragua, nongovernmental organisations (NGOs) have put huge efforts into stimulating the production of quality cacao by connecting farmer co-operatives to large foreign companies.

“It seemed that if cacao could be produced by farmers and exported at a reasonable price, development goals would be achieved,” he said. But what about local markets? Cacao has played an essential role in the local economy for more than a thousand years, said Van Oudenhoven. “Millions of people drink cacao-based drinks and yet I know of no NGO putting time and effort into improving the cacao production for use in local drinks.”

Van Oudenhoven argued that it would make more sense to focus on improving local production, local knowledge and local markets before looking to regional or international opportunities. His point was echoed by several participants, including fellow speaker Roger Blein from Bureau Issala, who said “Before conquering world markets, we need to focus on regional and local ones.” One online participant suggested that a progressive approach — starting...
Making markets work for the poor is all about connecting small-scale farmers to niche export markets. Or is it? Participants at the provocation seminar “Making markets work for the poor: Contents and discontents”, held in Paris on 30 March, called on development agencies to turn their eyes away from export markets and take a closer look at local ones.

Text: Sian Lewis

with local markets and then moving up to regional, national and finally export ones — would also help farmers reduce risk. Julienne Brabet from Université Paris Est Créteil raised an important question, asking “if we don’t start with local development and go straight for an export-driven economy, will we miss the target of alleviating poverty?” Van Oudenhoven’s answer: yes — linking to export markets may be positive for some farmers, but not for all. “The coffee sector in Nicaragua has been helped quite a lot by NGOs, which is fine, but other sectors are still struggling with the same problems they were facing 20 years ago.” Other local actors lose out too. “With an international business dominating the local market the development of local traders is by-passed, the higher quality produce is exported leaving local producers with the inferior product and often with a shortage,” said van Oudenhoven.

Jérôme Coste, director of the Institut de Recherches et d’Applications des Méthodes de développement (IRAM) agreed, adding that in his experience, a focus on exports can, in some cases, also increase socio-economic inequalities at the local level. Partly this is because, as noted by one online participant, when you start getting involved with big business — even for Fair Trade products — attention is focused only on price, and other key aspects of making markets work for the poor, such as capacity building, fall by the wayside.

The hard path A focus on exports has big implications for food security too, according to Blein. This is because it acts as a disinvestment in the food sector. The result is that agricultural areas of Western and Central Africa — where 70 percent of the population is involved in agriculture — now find they have a negative balance of food despite being large exporters, still reliant on imports to meet demand for staple foods such as rice, milk and meat. Blein argued that the development of value chains would have more impact if we respected staple food crops. Earnan O’Cleirigh, from the OECD’s Development Assistance Committee agreed, arguing that the problem is that development agencies and NGOs tend to focus on markets based on commercial opportunities rather than picking markets that are important for the poor and on which they base their livelihoods. For many people in sub-Saharan Africa, these are basic food crop markets — rice, cassava, sorghum, millet and banana, for example.

So why don’t we focus on these local markets? It’s largely because they are difficult. “They don’t link easily into export markets except regionally, they don’t have big commercial opportunities and they work very inefficiently,” O’Cleirigh said. It seems that development actors too often seek out interventions that will be seen to be successful. But if we are to really make markets work for the poor, perhaps we must start choosing the hard path.

More information
To find out more about the provocations visit www.iied.org/provocations, where you can also find links to watch past seminars on producer agency, on “rights versus markets” and on making markets work for smallholders.
More and more land in Africa is being cultivated, reducing the area covered by forests, the existing biodiversity, and affecting the water supplies of nearby cities. Could farmers produce the same services as forests do — at least partly? The World Agroforestry Centre is working to develop arrangements between farmers and private parties in a bid to have farmland supply clean water and carbon sinks. But what should farmers get in return? Money is not the only reward they are looking for.

Text and photo: Godfrey Mwaloma

For several decades, forests and grazing lands in Africa have continued to deteriorate, and rural communities have taken the blame for cutting down trees and overusing common land. But since the 1950s governments and the global conservation movement have deliberately excluded farmers from this resource, taking over control of forests and establishing parks or government-managed forest reserves. Farmers thus lost their feeling of ownership, while their numbers grew and the forests and communal lands were not fully protected. The result is that, today, large areas of previously forested land have been lost. Forested watersheds where biodiversity thrived and which provided clean water, fuel and timber in abundance have now dwindled.

Can farmers provide environmental services (such as habitats for wildlife, carbon sequestration, climate regulation or the regulation of water flows and quality) in addition to producing food? Around big cities in Africa the situation is particularly precarious. But the rural communities who have been blamed for most of the degradation are best placed to become wardens of the environment. So far, farmers in Africa have rarely been rewarded for their environmental services. Some live next to hydroelectric power plants that utilise water from their land and yet they are not provided with electricity. These farmers continue to use wood for their fuel, and hence continue to degrade forest ecosystems.

Agroforestry is uniquely suited to improving food and fuel security, while sustainably managing agricultural landscapes so they continue to provide essential ecosystem services. But how do we get more farmers to adopt agroforestry and other suitable land use practices that secure the continued provision of these environmental services?
Experimenting with rewards

The World Agroforestry Centre (ICRAF) is conducting research on the ways to promote more productive, diversified, integrated and intensified agroforestry systems that provide livelihood and environmental benefits. ICRAF is working with the International Fund for Agricultural Development (IFAD) in a research programme aimed at building knowledge about the necessary rewards for environmental services. This programme is called “Pro-poor Rewards for Environmental Services in Africa” (PRESA), and is linked with local research and farmers’ groups to identify and establish those arrangements that bring multiple benefits. The programme is working in seven sites (three core and four associate sites) in the highlands of East and West Africa, where there is immense pressure from growing human populations and demand for increased food production. PRESA does not consider rewards for environmental services solely in terms of monetary compensation, but has adopted a broader perspective (see box on page 26).

A first condition is that those who need the environmental service recognise the importance of rewarding the one who provides it. As a market-based mechanism, with buyers and sellers, rewards for environmental services must involve establishing a correct price. Price setting is difficult because the market for environmental services is neither open, nor transparent. With little data from related markets it is often difficult to determine a market price. Moreover, buyers cannot choose their suppliers. For example, a water scheme has to make a deal with a particular group of farmers – it cannot look for another (cheaper) group outside the catchment area of their water source. So buyers and suppliers need to strike a deal – which can easily result in dissatisfaction or conflict.

Auctioning services

A pilot programme in Malawi where farmers get cash payments for growing trees could provide useful lessons in price setting. A study by ICRAF researchers in 2008 examined two different approaches to setting prices and allocating environmental service contracts: an auction and a fixed price offer. An initial survey identified 27 villages with 538 households. A total of 467 people were registered as eligible for the contracts and divided into two equally-sized groups. The first group was exposed to the “auction” method. Individuals made bids on how much money they would require to allocate half an acre of their farms to trees. The bid cards were collected and the data analysed. Naturally, there were both high and low bids, varying from 100 Malawi kwacha (€ 0.46) to almost 1 million kwacha!

The second group was exposed to a “fixed price” method. The data from the “auction” was used to set a realistic price, considering everyone’s opinion and the available budget. This was offered to the second group as a fixed price: 12,000 kwacha (circa € 55) per half an acre. Over 90 percent of those in the second group agreed to this price. This exercise is expected to avoid any potential conflicts, as it has transparently set a clearing price mechanism that was offered to anyone interested in a contract.

Pricing water quality

In Kenya, the Sasumua watershed supplies Nairobi with almost 20 percent of its water needs. Most of the rivers feeding the Sasumua Dam flow through intensively cultivated areas, where land use decisions have a great impact on downstream water flows and quality. Over the last few years, the area has seen a clash of interests between water authorities and local communities. A fair reward system might help to create a win-win situation. In such a situation, what level of rewards would be fair to both parties? The project first sought to understand how agricultural best practices, such as contour grass strips, contour farming and agroforestry, affect the quality and regime of water flowing into the reservoir and treatment plant. The project also determined sediment levels and the cost of purifying water under

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different land management scenarios. A cost-benefit analysis of conservation practices and savings allowed land owners and the Nairobi Water Company to make a decision on how to set a reward scheme, and on whether to participate in it or not.

The Sasumua Water Resources User Association, a local group for the equitable allocation of water rights, says that its members are more interested in obtaining assistance to implement land conservation measures than in cash payments. They want the Nairobi Water Company to help them to establish rain water harvesting technologies.

**Mixed rewards** The role of agriculture and forestry in carbon sequestration to mitigate global climate change is well documented, but it is difficult to price carbon or find ways so that communities benefit from this exercise. Ecotrust Uganda, an organisation that is developing environment conservation financing, is working in a carbon sequestration scheme with small-scale farmers. The scheme prepares a contract with individual farmers with targets for establishing trees. Farmers who achieve the targets are issued carbon payments of 632 euros for establishing and maintaining one hectare of woodlot. The payments come from local and multinational corporations interested in carbon credits, such as Tetra Pak, Camco, Nedbank and African Safaris. The majority of farmers participating have between one-half and two hectares, resulting in payments ranging from € 316 to € 1,264. This total is paid in five instalments over a ten-year period, provided that producers continue meeting certain “milestones”. Apart from providing additional income, the trees protect soils from erosion while providing shade, medicine, fruit, wood fuel and construction materials.

When carbon payments are distributed to each individual farmer, the amount often doesn’t justify the effort. So most carbon projects (and other PES projects) in the region tend to focus on collective benefits to a community, for example, roads, schools, access to markets, access to farm inputs, etc. One way to optimise the benefits for individual farmers is to initiate nature-based enterprises through “eco-labelling” schemes. Such a label provides products such as honey, baskets and fruits with better access to global markets and relatively higher prices. Eco-labelling can become an important extra source of income for farmers and contributes to sustainable carbon binding.

**Policy solutions** Policy makers have grappled with the dilemmas of livelihoods and conservation for decades, and they welcome the arrival of schemes that offer practical solutions. Farmers can be convinced of the merits of sustainable land use management if such schemes consider the costs in terms of lost income opportunities, or the costs of implementing land management technologies. Rewards for environmental services offer an obvious compromise between livelihoods and conservation. There is no denying that there is much to learn on how to establish efficient and sustainable mechanisms to reward communities for sustainable land use and to ensure that buyers of environmental services can be sure that they get value for their money. But in the long-term it is the only solution to overcome further degradation of the rural environment in Africa.

Godfrey Mwaloma is Communications Officer at the PRESA project at the World Agroforestry Centre (ICRAF), Nairobi, Kenya. E-mail: g.mwaloma@cgiar.org. More information can be found online: http://presa.worldagroforestry.org
LEARNING ABOUT

Planting trees, rooting awareness

"Agriculture is sustainable if it can attract future generations of young farmers". These were the words that Edith van Walsum, ILEIA’s director, used to open the editorial in our previous issue. A similar idea lies behind The Green Wave, an initiative of the Convention on Biological Diversity. This is an international campaign involving schools in more than 70 countries, the aim of which is to raise awareness around the importance of biodiversity among children and youth.

Text: Nicola Piras  Illustration: Fred Geven

E ach one of us, whether as a producer or as a consumer of agricultural products, can have a strong influence on how these are produced. Hence there is a need to inform and educate everyone about how farming can be efficient and sustainable. A particularly relevant aspect of this is the biodiversity of a farm or a region – an issue that is recognised as important by the international community through the Convention on Biological Diversity. Since 2008, The Green Wave campaign has contributed significantly to the annual celebration held on the 22nd of May, the day proclaimed by the UN as the International Day for Biological Diversity. Taking part in it is easy and fun. As the Executive Secretary of the UN Convention on Biological Diversity, Ahmed Djoghlaf, explains, “we have kept the project simple and adaptable to enable the participation of as many schools and young people as possible around the world. Teachers have access to a series of resources and guiding instructions on the Green Wave website. They are welcome to create their own projects and/or integrate biodiversity components in their existing curricula”. This year’s theme, reflecting the International Year of Forests, was forest biodiversity. As always, participants were requested to count down to 10:00 a.m. local time, when they planted a locally important tree species. Wherever this was not possible, for example because of climatic reasons, students could still participate in the event by watering the trees in their schoolyard, or by taking another action to support trees and forests. Each single action contributed to the creation of a figurative “green wave” travelling west around the world.

Why planting trees? “In terms of learning”, according to Dr Djoghlaf, “what better than a tree to demonstrate the interconnectedness of species and ecosystems? A growing tree represents a microcosm of biodiversity, a micro-ecosystem in itself – sustaining life in the soil and the roots, in the bark, leaves, flowers and branches – microscopic organisms, fungi, plants and animals of all kinds.... There is so much there to observe and study!” “Moreover,” he continued, “there is something fascinating and intrinsically attractive about planting trees. There is strength in the idea of giving and sustaining life – and in particular to something that could live and grow for centuries.” The idea of co-operation, working together to make a big difference, is another key aspect of the campaign. The promoters’ hope that participants will associate caring for nature with the real pleasures of discovery, sharing and giving something back. “We also hope that they enjoy working together as a group, and as part of a worldwide movement. They get a chance to be part of a global community of young people who care for the planet and co-operate, beyond borders, to safeguard the well-being of humanity”.

The Convention on Biological Diversity aims to conserve biodiversity, ensuring the sustainable use of biodiversity and enabling the fair and equitable sharing of benefits arising from this. To know more about the Convention you can visit its website: http://www.cbd.int. In 2012 the theme of The Green Wave will reflect the importance of marine and coastal biodiversity. All the information and instructions for teachers and students interested in taking part are available (in English French, Japanese and Spanish) at The Green Wave website: http://greenwave.cbd.int.
The establishment costs and access to seeds of these highly needed leguminous trees have been found to be the main challenge in many countries. Low, late and unpredictable germination rates make it unreliable to seed plants directly in fields using the methods that are generally recommended. These can even cause low germination rates in nurseries. The seedlings need to grow big enough to survive the dry season (especially on infertile or eroded soils) and to compete with weeds. Common direct seeding methods usually lead to a maximum survival rate of only 15 percent. While many farmers have recently established calliandra trees on their farms, many more would do so if it was easier.

The green, hilly, humid and sub-humid areas to the north west of the town of Kisumu and Lake Victoria, in western Kenya, exhibit many of the common difficulties facing farmers wishing to have calliandra (and sometimes other tree-legumes) on their farms. They see it as a way of being able to support (more) livestock. Fifteen years ago when I was in this area I started a research process, building on my previous experience in Rwanda, Kenya and Ghana, and this process has continued since, on an informal basis. My main interest was to find out how to make it easier to establish calliandra. Several farmers have participated in this project in different ways. Nearly all the farmers asked expressed their interest in calliandra, but only if it could be seeded easily, and they were not willing to invest much work or money. Soils in this area are usually nitrogen and/or phosphate deficient, and manure and fertilizer often benefit the weeds more than the tree seedlings. So we first tried different direct seeding based experiments in the unfenced fields of ten farmers, looking for ways to increase the germination and survival rates. At the same time, I started several controlled, replicated experiments in fenced fields rented from farmers in adjacent areas (Maseno and South Kaponja). Briefly, our experiments on germination showed that:

- Using a sandal with a flat rubber sole to scratch the seeds against a coarse cement floor or rough grinding stone (just enough to perforate the shiny seed coat so they take up water immediately after planting) can increase field germination after two weeks by 2-3 times, reaching a total of up to 90 percent. This process is known as mechanical scarification.
- Soaking the scratched seeds about 8 hours in a flat basin with unheated water helps;
It is better to sow the moist swollen seeds early in the rainy season at a depth of 5 cm or a “half finger”. In case of continuous sunshine right after seeding, this can then help seeds to emerge even if the upper soil layer becomes hot and dry (as this layer can be pushed aside after five days).

Our experiments showed that applying kitchen wood ash (in concentrations of about 1%, as otherwise the roots can suffer) can give excellent results, and so did transferring nitrogen-fixing bacteria directly into the field where these are needed. It is also important that advisers and farmers get a complete insight of what can be modified and what cannot in order to get positive results under different conditions – for example, when using stored dry seeds or when their fields are less fertile.

**Farmers showed interest**

Ten farmers from a dairy-farmer-group from Ebusakami came to visit the fields where we were completing our field-experiments. Most of them got most of the direct seeded seeds to germinate and survive – even though they started their process rather late in the rainy season. Most distributed seeds to friends and said they wanted to expand this practice.

At the end of the project, we were interested in seeing if farmers would be willing to pay the local cost for seeds if shown how to grow them in their fields. Two hours labour could pay for the 400 or so seeds that they usually wanted and scratching the seeds could be done in ten minutes; in contrast, transplanting bare root seedlings would require investing several days work. All ten farmers asked were willing. We have also freely distributed advice and very small seed samples at a few meetings and events and found this worked well. Many farmers who participated have at least a few trees and are directly seeding more.

Good extension can help to realise a big potential. Some extension organisations in western Kenya and Tanzania were trained in the technique and the brief feedback they provided was very positive. Farmers appreciated the uses to which calliandra could be put. They often found new ones too, and liked the alternatives to frequent low pruning we developed that, for example, allowed good seed and wood formation between crops. Extension and research organisations on several continents have expressed an interest in the results, and several international research papers have been published. These methods can also be adapted to other species and climates.

Developing methods better suited to farmers’ priorities and limitations can open up many new possibilities. The photo shown here is from Ebusakami, where the farmer directly seeded calliandra using the improved methods we developed. Calliandra now provides him with much-appreciated fodder, firewood, soil and water conservation properties, good fences, poles, support for his passion fruits, and the farmer’s own invention: a living cloth drying site. Many of his neighbours have asked him for seeds or picked seedlings.

**method**

Calliandra hedge direct seeded by farmers in Ebusakami using improved low-cost methods and then twisted together. It is being browsed by their well-tethered cows.

Torsten Mandal is a Danish agronomist specialised in tropical agroforestry and soil fertility management. He currently works as a freelance consultant, trainer and researcher with various organisations. He was previously attached to the Agroforestry Division of the Kenya Forestry Research Institute. E-mail: torstenmandal@gmail.com.
Who will feed the world? The production challenge
Publications on the topic of global food security are piling up and so the time has come to become selective. This report is a good place to start. It provides an overview, with a strong empirical basis, of the pros and cons of small and large-scale farms and of low and high external input systems (LEI and HEI). It argues that there is no one-size-fits-all model. The best way to attain food security is to build on the co-existence of different farm types. In addition, and of no surprise to the readers of this magazine, “successful LEI agriculture practices already in place could provide useful lessons for developing countries and in Africa in particular.”

Small is successful: Creating sustainable livelihoods on ten acres or less
Small-scale farming is promising, even in Europe. That is the conclusion of this report, which looks at the economics of eight typical small-scale farms in the U.K. that operate on less than 10 acres (4 hectares) of land. The smallholders have all developed their holdings slowly to avoid (risky) loans, acquire the skills and knowledge necessary for the job and fine-tune practices to their specific agro-ecological context. They diversify production to spread risks, capture added value through on-farm processing and direct marketing, and realise productivity gains through the intensive use of labour. The promise of smallholders lies in their ability to operate successfully on marginal lands, generate high levels of employment and be highly productive and profitable.

Collaborative change: A communication framework for climate change adaptation and food security
Ever wondered about the role of communication in development? Once you start thinking about it you realise it can’t be ignored. This publication provides a general framework of a communication approach to development. Its starting point is that development agencies must identify and build on coping strategies that enable vulnerable households to maintain or improve their livelihoods in the face of climate change. For this to occur effectively, rural knowledge institutions must be strengthened, access to knowledge and information improved, and the households encouraged to actively participate in decision making. This can be facilitated by ComDev (communication for development) which includes the use of participatory communication processes, strategies and the media to get all stakeholders to share their knowledge and experiences.

Guidelines for spate irrigation: Irrigation and drainage paper 65
As most regular readers of FAO’s irrigation and drainage series would expect, this guideline offers a solid, comprehensive and practically-oriented account of spate irrigation, a system through which flood flows from mountain catchments, are conveyed to irrigable fields. This guideline goes further than previous issues, not only looking at the hydrology, engineering design, water and soil management, economics and crop production aspects of spate irrigation, but also looking at the social setting, tenure issues, water rights, farmers’ organisations, and at how these aspects are interconnected. The paper is based on project experiences and describes traditional spate irrigation schemes.
More on trees

There is a forest of information available on trees. The ICRAF website contains country specific as well as globally relevant publications such as “Creating an evergreen agriculture in Africa for food security and environmental resilience” (2009) and “Trees on farm: Analysis of global extent and geographical patterns of agro-forestry” (2009). The websites of Trees for the Future and Agroforestry.net also have plenty of resources about trees. CIFOR's website also has a section on small-scale and communal forestry management; the UN has a section dedicated to the international year of forests, while the Global Forest Coalition takes a more people-oriented perspective towards forests. Recent publications of note include “The state of the world's forests 2011” (FAO, 2011) and “How communities manage forests: Selected examples” (FORZA, 2010), which look at forests and livelihoods. We found two books that examine the factors that influence the adoption of agroforestry: “Seeing beyond fertilizer trees” (Kiptot, 2007) and “The impact of agroforestry-based soil fertility replenishment practices on the poor in Western Kenya (Place et. al., 2005). On a different theme, “REDD: A casebook of on-the-ground experience” (N. Virgilio and S. Marshall, 2010) and “REDD: The realities in black and white” (Friends of the Earth, 2010), both evaluate REDD in detail. More academic papers can be found in the Advancements in Agroforestry Series and in the Agroforestry Systems Journal. (LvdB)

Land deals in Africa: What is in the contracts?

Land acquisitions by foreign investors: are they theft or a fair deal? This report looks at 12 land deals from the perspective of sustainable development. It identifies several problems with them. First, the contract terms are often short, unspecific, and promise vague investment benefits while granting long term rights to businesses. Second, they often lead to the centralisation of control over the land, marginalising local people’s involvement in decision-making. This increases the gap between local legitimacy and formal legality. Third, the contracts often lack any detail about how local land rights can be exercised. Finally, the vision of governments, which often sees large scale farming as the way to “modernise” agriculture is often not rooted in the experiences of local farmers.

Food sovereignty: Reconnecting food, nature and community

The high-input model of agricultural development has not only failed to eradicate poverty and world hunger; it is part of the problem. La Via Campesina has emerged in opposition to this approach and has introduced the notion of food sovereignty, which describes “the right of nations and people to control their own food systems, including their own markets, production modes, food cultures and environments”. This book describes the failures of the dominant food regime, how the food sovereignty concept and movement have emerged, how the relation between agriculture land and the environment can be restored, and also the importance of seed sovereignty.
Trees bring many benefits, even if these are not immediately visible and not all farmers recognise it. Here are some examples from different parts of the world about how trees help increase production and incomes.

**Ensuring water availability**

The lowlands ranging from the Chure hills to the border with India, or the Terai, have for long been known as Nepal’s “food bowl” region. The grazing fields and the forests at the feet of the Chure hills, known as Char Koshe Jhadi, helped filter the sand and debris in the waters flowing downhill, while ensuring the availability of water (and nutrients) to the farm lands downstream. But large parts of the forest area have been cut down and floods have become more common. At the same time, farmers are experiencing problems with the groundwater irrigation systems, as the water tables have lowered drastically. Fortunately, there is a growing recognition in public and private organisations of the advantages of having a forest close to farms and of agroforestry in general. The government of Nepal is supporting the Chure Watershed Conservation Programme, through which farmers are planting fast-growing multipurpose tree species along field boundaries, on bunds and on marginal lands. This is providing new employment opportunities to local communities and farmers are already experiencing higher yields.

More information? Contact Pramila Dhakal, currently studying at the College of Agriculture and Natural Resources, National Chung Hsing University, Taichung, Taiwan. E-mail: forpramila@gmail.com

**A broader income base**

Based in the south-west region of Cameroon, CENDEP runs training programmes in the domestication, sustainable production and marketing of non-timber forest products. Its Analogue Forestry programme helps farmers to increase yields and the diversity of their production by introducing native and exotic tree species that have an economic and ecological value. The focus is mainly on restoring and protecting deforested areas that serve as communal watersheds. In addition to running a training programme, CENDEP has convinced local authorities to assign previously uncultivated communal land to women’s groups. The forests they establish and protect are designed to work as “carbon sinks”, and they hope to benefit from the REDD+ funding mechanisms. CENDEP is currently addressing the issues involved in making such an application (such as measuring carbon quantities, and securing the land rights of indigenous communities). In contrast to other initiatives, their efforts are not directed at “not harming the forests”, but rather focus on “positive actions”: preparing management plans and sustainably harvesting products.

More information? Contact Wirsy Eric Fondzenyuy, Knowledge Management Officer, CENDEP Cameroon. P.O. Box 742, Limbe, SW Region, Cameroon. E-mail: wirsiyef@yahoo.com
Farming Matters

Alternatives to slash and burn

Shifting cultivation has been practiced with relative success for thousands of years. But growing populations mean that farmers are often forced to use shorter fallow periods. The land becomes incapable of restoring itself, degrades, and becomes unproductive. One alternative, tried successfully in different countries, is to plant rows of *Inga edulis*, which can be pruned after two years, and then sowing maize in the mulch of leaves and thin branches. Not only are better harvests achieved, but, as the nutrients are recycled through the mulch, the fertility of the soil is maintained, making it possible to farm in one place for many, many years. The main benefit is that far less forests will be destroyed by slash and burn agriculture.

FunaVid, a local environmental charity, together with Rainforest Saver, a U.K. charity, is setting up a demonstration farm in the Atlantida department, not far from the Pico Bonito National Park. Working closely with the CURLA University in La Ceiba, their objective is to convince farmers and students of the benefits of combining trees and farming for sustainable yields and incomes.

More information? Visit the Rainforest Saver website (www.rainforest saver.org) or contact Charles Barber: charles.barber13@gmail.com

Maintaining cultural heritage

Farmers in the Netherlands have been keeping cattle and producing milk since the Middle Ages. Their grasslands included trees like alders (*Alnus glutinosa*) or willows (*Salix spp*), which were important sources of firewood and timber. Since the 1950s, however, the demand for firewood decreased dramatically (as farmers came to rely more on fossil fuels to heat their homes), and many farmers saw no reason to keep trees on their farms – especially because they made mechanisation more difficult. Yet, it is now increasingly recognised that this agroforestry landscape is part of a cultural heritage, which must not be lost. Plans are being discussed for a national “landscape fund” to support farmers. In the meantime, local authorities in the area known as the Gelderse Vallei are taking steps in the same direction.

By combining subsidies with income-generating activities, farmers are able to benefit from the growing demand among the urban population for green areas or for “traditionally produced” products. Some farmers are even starting to grow alders as a local source of firewood for heating their stables, thus reducing their energy costs.

More information? Write to Hans Peter Reinders at the municipality of Leusden, where he works as policy advisor. E-mail: hpreinders@hotmail.com
25 years ago, that he decided to sell most of his land to pay off his debt. From having about 40 hectares, he was left with just under 2, but he was now debt-free. He realised that he had been following an idea of farming that was based on money, but that he needed to look at more than money. Only a few decades ago most Thai farmers had little money, but could find all they needed from their land and the forest for food, medicine, to make baskets, to build homes and to fuel their stoves.

Trying a different approach Now completely broke, but without any debts, he decided to focus on harvesting and growing what he really needed. While living off harvesting wild greens, he started planting vegetables such as kangkong (*Ipomoea aquatica*). When this grew well, he found that after feeding his family and giving more away, he still had plenty left over. He took this to the market and returned with about 20 baht (or 50 euro cents). This was not a large amount, but still better than before. He had no bills or creditors to pay, so this small sum of money was his family’s to keep.

The Wanakaset concept followed from this simple
Wanakaset, a word which translates directly as “forest agriculture”, is both the name of a farm and of a network of farms and farmers in Thailand. But it also refers to a farming concept which goes beyond agricultural production to look at self-sufficiency and the relationship between man and his natural environment and resources.

Text and photos: Michael Commons

Wanakaset ensures that we have enough to eat and enough production to meet our other needs, but farmers also need some sort of insurance. How can farmers get life insurance? We have found that the easy answer is to have good quality forest trees. In Thailand, as elsewhere, there is now a scarcity of fine wood, but in our conditions forest trees grow quite rapidly. A 20 year old rosewood, teak, mahogany tree, or of the Dipterocarpus species, like those on Pooyai Viboon’s property, is worth more than US$ 1,000. Such forest trees are extremely hardy and easy to grow. Dipterocarpus trees generally grow high and have a small canopy so do not take much light away from the understory. One can plant trees for one’s old age or to pay for the children’s university education. One-sixth of a hectare can easily hold more than 100 forest trees, many fruit trees, perennial vegetables and herbs. The reality of a natural forest, as we apply it in Wanakaset, would be quite different from that of a plant bearing forest. While annual vegetable crops meet our needs, they require regular labour. But there are many traditional perennial fruit and vegetable crops that continuously provide food but which do not require much physical effort after their establishment. In addition, some are extremely hardy, and are tolerant of floods and drought. By paying attention to the existing biodiversity, to our own labour needs and constraints and also to an area’s natural succession patterns (see box), one can transform a piece of land into a bountiful food forest. Initially there will be a lot of sun and annuals will do best. At the same time one can start planting crops like bananas, papayas, Sesbania grandiflora, moringa trees or the “multivitamin plant” (Sauropus androgynus). These hardier plants are easily established and start to provide regular yields in one year or less. Trees that bear fruit well in forest conditions, such as jackfruit or coconut, can also be established.

Looking forward Wanakaset practitioners differ from most Thai farmers. While we also think that the production of rice is important, our main emphasis is on developing our farms into a food and medicine forest. Because Mr Viboon was already over 40 when he started this shift, he paid special attention to his own energy and labour. While annual vegetable crops meet our needs, they require regular labour. But there are many traditional perennial fruit and vegetable crops that continuously provide food but which do not require much physical effort after their establishment. In addition, some are extremely hardy, and are tolerant of floods and drought. By paying attention to the existing biodiversity, to our own labour needs and constraints and also to an area’s natural succession patterns (see box), one can transform a piece of land into a bountiful food forest. Initially there will be a lot of sun and annuals will do best. At the same time one can start planting crops like bananas, papayas, Sesbania grandiflora, moringa trees or the “multivitamin plant” (Sauropus androgynus). These hardier plants are easily established and start to provide regular yields in one year or less. Trees that bear fruit well in forest conditions, such as jackfruit or coconut, can also be established.

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Multi-layers This layering approach to agriculture is not limited to food forests. Even in and around rice, a crop that needs a lot of sun, some trees with narrow canopies can be established without any loss in yields. Dipterocarpus species are a fine choice for this, especially because they are flood tolerant. Their deep roots recover nutrients and return them to the topsoil for the rice to use. (Sri Lankan traditional wisdom recognised these trees as rice “fertility managers”). Organic farmers in northern Thailand grow pineapples, cabbages and other leafy greens under the canopy of mango and longan trees. Surprisingly, the leafy greens do better with partial shading in these farms. Another farmer in Chachoengsao has found that the same is true with tomatoes. Some farmers point that the increases in heat and sunlight in recent years mean that many vegetables do not perform as well as they used to in open conditions. Integrated cropping seems to be a good way to adapt to climate change. Wanakaset can also be integrated into existing orchards and even rubber plantations, and more and more options are being found by innovative farmers. Pepper, passion-fruit and yam vines can climb the tall trees. Ginger species do well in more shaded areas. Coconut, sugar palm, and areca nuts provide a lot of value without taking sunlight form other plants.

Like a natural forest, Wanakaset has a good ecological balance and an efficient nutrient recycling process. Once established, very little is needed in terms of external inputs or pest control. Having diverse yields greatly reduces the risk posed by fluctuations in the climate or market price. Production to meet one’s needs for food, medicine and other uses greatly reduces one’s expenses. Integrating forest trees provides an insurance plan to pay for expected and unexpected future needs.

Our network of farmers has shown that just a small step in this direction is enough to change a farmer’s situation from being increasingly in debt to having an increasing natural capital. This natural capital also provides an addition dividend in being a biodiversity reserve. Mr Viboon’s 2 hectares today look more like a virgin forest than any forest nearby, although only 30 years ago there were no trees there at all. His children and the many members of the Wanakaset network collect seeds and seedlings from this land for their nurseries, which are now recognised as amongst the best for forest and herb species in Thailand.

Michael B. Commons works with the Earth Net Foundation in Thailand, supporting organic farming and fair trade. He also practises organic farming and the Wanakaset methodology with his wife on their farm in Chachoengsao. E-mail: michael@greennet.or.th. More information can be found on the foundation’s website: http://www.greennet.or.th.
About seventy percent of sub Sahara Africa is in the semi-arid tropics. Farmers there are among the poorest in the world, as low soil fertility and erratic rains lead to poor yields. Trees are significantly more resilient to such conditions than the annual crops that most farmers grow. Why is this not fully exploited?

One way could be to find trees whose products have a similar or higher value than that of annual crops. This is actually the situation in the Mediterranean, where farmers get a significant income from olives and figs. The domesticated *Ziziphus mauritiana* or Pomme du Sahel might be one such species. Its fruits are 10 to 20 times bigger than the fruit of the wild variety and there is a local market for it. Shea nut (or karité) is another option. This is a common tree in the region, and the oil in the kernels is very valuable. In both cases, grafting wild trees with superior strains can increase the yield and quality.

Agro-pastoralism is the dominant production system in the region, but livestock consume all the crop residues and the resulting bare soil becomes susceptible to erosion. As seen in southern Niger, agroforestry can help conserve and revitalise the soil. To date it has had a strong impact: farmers adopting it have seen their crop yields and incomes rise by almost 50 percent. *Faidherbia albida* – locally called *gao* – is a nitrogen-fixing tree and an ideal species for this purpose. It sheds its leaves during the rainy season and does not compete with annual crops. Reports from Zambia show that the soil’s organic matter and nitrogen content increases under *gao* trees, and the yield of maize can double or even triple. Some governments now promote agroforestry systems based on *gao*, as it is an excellent solution to the problems of land degradation and the sharp increase in the price of fertilizers.

The technical solutions are known. I think that the problem is that development agencies and governments do not understand the ecological context in the semi-arid tropics very well. Their rural development strategies are often based on experiences in temperate or tropical regions, and thus encourage high-yielding varieties of rainfed crops, intensive application of fertilizers, and market integration. They address only the symptoms and not the problems. Agroforestry offers a solution with ecological and social benefits. It provides an ecological framework in which cash crops thrive. Isn’t it the obvious alternative to the degradation and poverty we see in the semi-arid regions?
Whether as a result of rising food prices, or simply because the world’s population is expected to continue growing, many projects and programmes are specifically focusing on food security and on the need to produce more food. Yet quantities are not all that matter. Are we paying enough attention to the quality of the food being produced? Our partners describe how this issue is being addressed in Peru, India and China.

Teresa Gianella: “More than yields and profits” One of the main issues during the elections recently held in Peru was that, despite impressive economic growth rates, poverty levels remain high – especially in rural areas – and malnutrition is still a very serious problem. This is not only attributable to low yields. Teresa Gianella, editor of LEISA revista de agroecología, argues that the need for money often forces farmers to sell their own agricultural products with high nutritional value in the local markets or to intermediaries, replacing them with industrial food stuffs of less nutritional value. Fortunately, there are several local governmental programmes, in Peru and other parts of Latin America, that pay attention to the production and consumption of vegetables, or to the inclusion of nutrition courses in schools and in women’s organisations. Many follow the pioneering methods and approaches tried by NGOs with small groups, up-scaling them in terms of coverage and results. Yet, the Peruvian government has just signed a decree that allows the entering of GMOs seeds and the technology to support it, and this is making people wonder if there is a real interest in the quality of the food that we all eat. GMOs can help increase the overall yields of some crops, but do not necessarily contribute to a diverse diet at a local or national level. “What I find scary is that no government official has mentioned the important link between production and consumption”. These are issues which, fortunately, are now receiving more attention.

T.M. Radha: “Less pulses; wrong ways” For centuries, nutrition in rural India has meant a mix of cereals and pulses. Requiring very little water, pulses are ideally suitable for rainfed areas. But a sluggish growth in production has not been able to keep pace with the growth in population. While the demand for pulses kept increasing, supplies have been inadequate, leading to high price rises: at one time the price of pulses was higher than the price of meat. Not surprisingly, they are now rarely found in the diet of many rural people.
According to T.M. Radha, at the AME Foundation, this is the result of many factors. For decades, a combination of Green Revolution technologies and government policies has helped replace nutritious crops with those which can be easily sold in the market, such as rice or wheat. Research and extension programmes have focused primarily on these two crops. And the Public Distribution System (PDS), one of the world’s biggest government programmes for addressing food insecurity, has for years only focused on supplying cereals, and neglected the need of the poor for protein supplements.

So, chronic food insecurity and malnutrition persist. “The authorities’ interest in increasing production has led them to forget consumption”. Even more striking is the combination of Green Revolution technologies and government policies in the market, such as rice or wheat. This has helped replace nutritious crops with expensive “research solutions” to its food and nutrition problems.

Ren Jian: “Concern about food production” People in China are starting to worry more about food safety. Recently, there was a large controversy about the addition of chemicals to livestock feed. Since the late 1980s, clenbuterol, a drug used to treat breathing disorders, was added to pig feed in order to accelerate growth and increase the proportion of lean meat. Yet this chemical can affect the health of people who eat pork and its use was banned in 2002. When it was reported that the chemical was still being illegally used by the country’s largest meat producer, it sparked a nationwide campaign.

According to Ren Jian, editor of LEISA China, the Chinese government seems more concerned about GMOs. China has generally been more cautious about GMOs than western countries. Some envisage that the government will enact stricter laws concerning GMO import and export, research and development and production. Part of these plans is a new “grain security law” that should encourage local governments to produce more grain in accordance with regulatory guidelines.

However, “any new regulations are unlikely to have much impact on stemming the tide of GMO propagation”. The Ministry of Agriculture did approve the use of GM strains of rice and corn last year, setting the stage for the widespread cultivation and distribution of these strains. Many groups are concerned that existing and planned regulations to restrict the use of GMOs will not be enforced. Greenpeace has reported that illegal sales of GMOs are already taking place. Despite China’s apparent careful approach to GMOs, it seems as if the concern about the production of what many call “Frankenfoods” does not automatically translate into successful GMO regulations. (LE)
“It is not commonly understood how much – even in our hypermodern urban age – human health and well-being are influenced by forests and trees”

Professor Hannu Raitio, co-ordinator of the International Union of Forest Research Organisations (IUFRO) Task Force on Forests and Human Health, and Director General of the Finnish Forest Research Institute, Metla, April 7th, 2011.

“SUCCESSFUL REDD+ DEPENDS LESS ON FORESTRY STRATEGIES THAN ON AGRICULTURAL DEVELOPMENT STRATEGIES THAT RETAIN AND SUSTAIN FORESTS”

Representatives of the Rights and Resources Initiative and Eco-Agriculture Partners describe the linkages between REDD+ programmes, agriculture and tenure rights in the brief “Making REAL(U)right: Harmonising agriculture, forests and rights in the design of REDD+”, January 2011.

“Farmers can also establish a ‘fertilizer factory in the fields’ by planting trees”

Olivier de Schutter, UN Special Rapporteur on the Right to Food, refers to the importance of trees in the recently released report “Agro-ecology and the right to food”, presented at the 16th session of the UN Human Rights Council, December 20, 2010.

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