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UNCCD News

A bi-monthly update on the work of the United Nations Convention to Combat Desertification (UNCCD)

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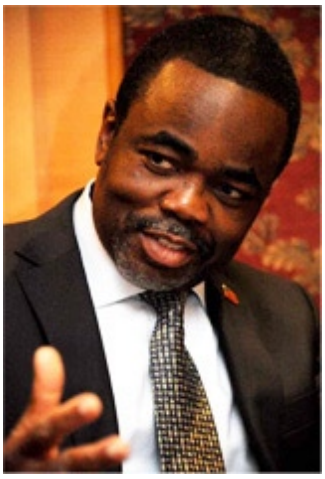
FROM THE EXECUTIVE SECRETARY

Food security's true foundation



In 2010 we launched the International Decade for Deserts and the Fight against Desertification (http://unddd.unccd.int). We featured agroforestry in a previous issue of UNCCD News, marking the January 2011 launch of the International Year of Forests (www.un.org/en/events/iyof2011). And on 17 June this year, we celebrated our annual World Day to Combat Desertification, this time under the motto "Forests keep the drylands working", in which dozens of events will illustrate how trees help ward off drought, restore soil health, and boost farm incomes in rural communities.

Given our concern for healthy landscapes, the feature story in this issue may seem very out of place. It takes us to the ice and barren solitude of Spitsbergen, a treeless island far to the north of Norway. But look again: deep inside a mountain there lies the Svalbard Global Seed Vault, a priceless trove of dormant plant life that is vital to the sustainability of agriculture – and dependent for its ultimate success on the restoration of degraded land.

Drylands: a cradle of crop diversity The gene banks at the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) and the International Center for Agricultural Research in the Dry Areas (ICARDA) respectively hold over 119,000 and 131,000 different seed samples, technically called "accessions", from about 144 countries – cereals, food and feed legumes and forages, both cultivated and wild varieties. But Svalbard, now in its fourth year of operation, dwarfs even these substantial assets. It holds well over half a million samples and has become the focal point of global efforts to preserve crop diversity.

Our link to Svalbard is that much of this crop diversity originated in the dry plains and grasslands that cover one-third of the world's terrestrial surface. Plant species endemic to these drylands make up 30% of the plants under cultivation today, and their ancestors and wild relatives still grow there – see "Agrobiodiversity in drylands", recently published by Germany's GIZ (download PDF at www2.gtz.de/dokumente/bib-2011/giz2011-0025en-agrobiodiversity-drylands.pdf).

Maize, beans, tomatoes and potatoes originate from Andean South America and parts of today's Mexico. Millet, sorghum and cassava, plus various species of wheat and rice, first grew in the drylands of Africa. The date palm and olive trees were initially cultivated in the Mediterranean basin and the drylands are home to a variety of valuable medicinal plants as well as trees useful in agroforestry.

Drought-resistant food In this new era of climate unpredictability, we can't forget that 80% of global agriculture is rainfed. If we neglect to foster crop diversity, especially the preservation and improvement of traditional drought- and pest-resistant grains and seeds, then harvests in the drylands of Africa, Asia, the Pacific States and the Americas could catastrophically fall short.

Our Convention supports communities and countries in their struggle to ease poverty and foster livelihoods in rural areas, particularly through programmes to prevent the degradation of land and facilitate its restoration to productive good health. Naturally, a key factor of the Convention's success is the resilience of food crops in the face of climate change, so we hold a major stake in the adaptability of smallholder farmers and the ongoing efforts to strengthen and protect the world's growing network of seed banks, especially the hard-pressed, under-funded in situ operators at national level.

And there's something even more fundamental to the success of these efforts: crops won't germinate and grow if fields aren't fertile. Let us remember this: the earth is both origin and final destination of all seeds. The true foundation of sustainable rural livelihoods and food security is healthy soil.

Luc Gnacadja
Executive Secretary

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INTERVIEW

"We need a global effort on this"

Norway is a front-line player in the global campaign to secure food supplies through the preservation of plant genetic materials

Grethe-Helene Evjen, a crop scientist by training, serves as Senior Adviser at Norway's Ministry of Agriculture and Food and Project Manager for the Svalbard Global Seed Vault. After graduation from university, she volunteered as a secondary school teacher in Northern Tanzania in the 1980s and then consulted on rural development there for the Canadian High Commission. Joining the Ministry in 1990, Ms Evjen has since then headed several Norwegian delegations to meetings of the FAO Commission on Genetic Resources for Food and Agriculture, joined negotiations for the International Treaty on Plant Genetic Resources for Food and Agriculture and attended meetings of its Governing Body. She spoke recently with Timothy Nater.

On Norway and crop diversity

Norway has been much involved in work on biological diversity for a number of years. One major reason has been the importance of food security and sustainable agriculture. Crop diversity provides the world with a wide selection of what one might call raw materials for the development of new crop strains and the improvement of production. Countries have traditional crops that are

Agriculture will adapt to climate change, degraded soils and a constantly changing variety of pests and diseases only if we can preserve the options given us by crop diversity.

uniquely adapted to its conditions. Some of these, together with wild related species, offer important characteristics for potential cross-breeding into robust new strains. This diversity gives us options for adapting agricultural production to climate change, degraded soils and a constantly changing variety of pests and diseases.

Norway aims to play a bridge-building role in the North-South debate about genetic resources. No country is independent when it comes to crop diversity. We need a global effort on this. That's why we also support the work of the Commission on Genetic Resources under the Food and Agriculture Organization of the United Nations (FAO) as well as the negotiations and implementation for the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA). Norway is one of the major donors to the treaty's fund and grant programme, which provides real gains for small-scale farmers and their food security.

On the management of national seed collections

Many developing countries have national gene banks but a lot don't have adequate back-up collections and are exposed to a number of threats. For example, seeds need refrigeration to keep from germinating, so a power failure lasting only a few days can destroy a whole collection. Also, seeds don't live forever, even if kept in very cold conditions. So many of the gene banks need to keep their accessions viable. It depends on the species, but after a few years, some seeds have to be regenerated, often meaning that the depositors must take them from their own gene banks, plant them, harvest new crops and then collect new seeds from them. That can be a rather complicated and time-consuming process. It's important for all of us to learn more about how seed banks are run and to help secure the management of their collections.

On the role of the Svalbard Global Seed Vault (SGSV)

The SGSV has special significance for a number of developing countries where storage conditions in regular gene banks are difficult. We see Svalbard as a unifying initiative to promote global collaboration in this field. In establishing the seed vault, I believe Norway has contributed to the preservation of the planet's most important biodiversity and helped to fulfil the main objectives of ITPGRFA and the Convention of Biological Diversity (CBD), a sister convention to the UNCCD.

The vault should be seen as an important element of the security strategy for national and regional seed collections. It is the ultimate back-up, the place of last resort. Formal agreements give the depositor full rights of ownership. The envelopes and crates of seeds are sealed by the depositor and will not be opened by anyone else, not even the technicians in charge of storage at Svalbard. All they will do is stack them safely in the shelves.

"Crop diversity provides the world with a wide selection of ... raw materials for the development of new crop strains and the improvement of production."

While some countries are eager to use the facility, others seem more reticent. It's a long-term commitment and there has been some hesitation. For some countries that have not yet decided to deposit seeds in Svalbard, I realize it's a big step to send their seeds out of their country. In some cases, people worry about protecting intellectual property and there are also practical and economic constraints. However, funding and technical assistance are available. The system is safe and it's working.

SCIENCE

Treasures of the Frozen Fortress

Sunk deep into the permafrost, a steel and concrete repository holds the final fall-back system for our future food supplies

Welcome to western Spitsbergen in the Svalbard island group, remote Norwegian territory deep inside the Arctic Circle. For four months of winter, there is no sun here. Precipitation is sparse, the cold intense, and the land rocky and devoid of trees. Yet this is no barren wasteland. An inestimable wealth of future plant life is being amassed here underground, an ultimate frozen refuge of all things vegetable and edible. This is the Svalbard Global Seed Vault, the entrance to which resembles a narrow wedge hammered into a mountainside overlooking the sea.

The seed vault is a key link in the network of the world's 1,800-odd plant gene banks. Fundamentally, its mission is to prevent starvation in the world. By safeguarding copies of the seeds of food-related plants already held by gene banks elsewhere in the world, it allows countries to restock their own supplies in case of loss or unforesee catastrophe – ultimate insurance when all else fails. Back-up systems mean safety, so Svalbard's remoteness is deliberate: few places seem more sheltered from man-made and natural disasters, whether wars, drought or earthquake, nuclear contamination, or a sudden rise in sea-levels due to global warming.

Rice on ice The Svalbard vault's appeal is global. The International Rice Research Institute (IRRI) last November sent 42,627 different samples of rice seeds from its own gene bank in the Philippines, adding to the 70,180 samples it dispatched to Svalbard in February 2008, when the

"No country – rich or poor – has within its borders the crop diversity required to meet future food needs. All countries need to improve the way they share their seed crop material as a matter of great urgency."

Dr. Shakeel Bhatti, Secretary of the Governing Body, International Treaty on Plant Genetic Resources for Food and Agriculture

vault first opened. With this second deposit, IRRI's cache in Svalbard grew into the largest number of seed samples stored there of any single crop and its wild relatives. Chilled to well below freezing, the seeds from IRRI should thus practically guarantee preservation of rice crop diversity for centuries to come.

On 25 February this year, the vault received an even bigger seed consignment. Enclosed in labelled silvery envelopes and packed in black plastic crates, the samples, technically called 'accessions', came from Peru, Syria, Ethiopia and the USA, among other countries. The shipments included seeds of rare Andean lima beans, dryland forage crops from the Middle East, blight-resistant melon and varieties of other plants and grains known to naturally thrive in flood, drought or other adverse conditions.

From Peru's Parque de la Papa and other breeding centres came 1,500 different varieties of potato. A large and varied consignment was put together by the Consultative Group on International Agricultural Research (CGIAR), the biggest contributors of seed samples to the Svalbard vault. And the US Department of Agriculture (USDA) sent tiny wild relatives of the tomato from the Galapagos islands whose genetic material has already gone into new hybrid tomatoes rich in anti-oxidant and vitamins.

The SGSV: Vital statistics

The Svalbard Global Seed Vault is already the world's largest repository of seed samples, also known as accessions. Some facts and figures:

Start of operations: February 26, 2008

Location: Outside Longyearben, the main town on Spitsbergen, principal island in the Svalbard island group, Norway, about 1,000 kilometres north of the mainland

Configuration: The seed vault lies about 130 metres above sea level, tunnelled 120 m. into the mountain. The three storage chambers measure 20 m. deep, 10 m. wide and 6 m. high

Current content (as at March 2011): About 650,000 seed samples, all of them duplicates of samples stored in gene banks elsewhere in the world

Total capacity: Some 4.5 million different samples, with up to 500 seeds per sample

Funding: Built for USD 9 million by the government of Norway; annual maintenance, operating and management costs covered by the government of Norway, the Global Crop Diversity Trust (GCDT) and the Nordic Genetic Resources Center (Nordgen)

On-site management and operation: Nordgen in line with a partnership agreement with the Norwegian government and the GCDT

Access and storage of seeds: Voluntary and free of charge. More details on nordgen.org/sgsv

Depositor logistics: For developing countries and international gene banks, the GCDT covers the costs of preparing, packing and shipping seeds to Svalbard

Temperature inside storage areas: Around -18 degrees Celsius. Below-ground location and a refrigeration system guarantee stable conditions for the foreseeable future

With no country self-sufficient in plant genetic material and related information, international cooperation and exchange of information are becoming pivotal for food security. Though hosted by Norway (whose government also paid for its construction), the Svalbard Global Seed Vault is part of the global framework of endeavour that includes the Global Strategy for Plant Conservation of the Convention on Biological Diversity (CBD) and the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), adopted at the Conference of the United Nations Food and Agriculture Organization (FAO) in 2001.

The treaty obliges its 127 signatory states to share genetic information about the world's 64 most important food crops, which account for more than 80% of the world's plant-sourced food. The

information is freely available to researchers, plant breeders and farmers. Between 600 and 800 samples are exchanged each day through the plant treaty's Standard Materials Transfer Agreement (SMTA), which has helped remove legal obstacles that in the past prevented breeders and researchers from gaining access to crop-breeding materials.

Traditional knowledge and farmers' rights The plant treaty's multilateral system holds governments of signatory countries responsible for protecting traditional agricultural knowledge and farmers' rights, especially their right to participate equitably in national decision-making about plant genetic resources. And by aiding farmers in the conservation and use of genetic diversity on their own farms, the treaty's Benefit Sharing Fund also supports the effort to conserve the materials that in turn eventually are fed into the Svalbard vault.

Significant progress has been made in the ex situ conservation of crops, that is the collection of seeds from different genetic varieties for cataloguing and storage in remote sites for possible future use. For some 200 to 300 crops, over 70% of genetic diversity is said to be safely conserved in gene banks, meeting the target set under the the CBD's Global Strategy for Plant Conservation. However, major efforts are still needed to conserve genetic diversity on farms. Additional measures are also required to protect medicinal herbs and roots, non-timber forest products, local landraces (varieties adapted over time to particular conditions) and the wild relatives of crops.

Fighting monoculture and climate change While the industrial approach to seed reproduction and farming has brought plentiful food to millions, fears are growing that monoculture has dangerously narrowed our reliance on just a handful of high-yielding crop varieties. In the USA, for

Nerica: New rice from old

A high-yielding hybrid demonstrates the value of "heritage" seeds

Researchers believe that about 3,500 years ago, Africans domesticated a native species of rice called Oryza glaberrima in the Inland Niger Delta, a green floodplain of river channels, lakes and swamps deep in the West African Sahel. Starting in the 17th century, however, O. glaberrima gradually gave way to Oryza sativa, a species imported from Asia.

By the 1990s, the higher-yielding Asian intruder had pushed the native African species back into a few pockets on remote farms. Despite higher nutritional levels of Vitamin B1 and iron and greater resistance to drought, infertile soils, and various pests and diseases than its Asian rival, O. glaberrima almost disappeared for good.

The best of both parents Then in the 1990s, scientists at the Africa Rice Center (known by the acronym WARDA) in Bouaké, Côte d'Ivoire, used conventional cross-breeding techniques to create fertile, high-protein progeny combining the best traits of both parents: high yields from the Asian and the ability of the African to thrive in harsh environments. They called the new rice Nerica, short for "New Rice for Africa", and were soon followed by success.

According to the WARDA website, Nerica is "perfectly adapted to the rainfed upland ecology in sub-Saharan Africa, where smallholder farmers lack the means to irrigate or apply chemical fertilizers or pesticides." When inputs are used, WARDA claims that Nerica varieties respond better than traditional varieties. The hybrid is even more productive than its Asian ancestor, offers farmers a shorter growing season, and is "spreading faster than any new farm technology ever introduced in Africa". First introduced in 1996, Nerica strains by some estimates today cover 230,000 hectares in West, Central, East and Southern Africa.

Writing on a BBC blog site, Dr Jeff Bentley, a Bolivia-based agricultural anthropologist, said of Nerica in 2009: "This new rice, descended from an endangered species, is helping Africa to feed itself, yet this opportunity would have been lost if O. glaberrima had gone extinct."

The inland Niger Delta, viewed from space, and (below) a sample of the hardy new African-Asian hybrid

example, more than 90% of fruit tree and vegetable varieties found in farmers' fields at the beginning of the 20th century are no longer there. According to the Convention of Biological Diversity (CBD) the number of local rice varieties cultivated in China declined from 46,000 in the 1950s to slightly more than 1,000 in 2006. Worldwide, the FAO estimates that 75 per cent of crop diversity was lost between 1900 and 2000.

Dwindling diversity might be leaving the world's food supplies dangerously exposed to unpredictable damage from pests, disease and climate change. A UN study last October said that changing weather patterns could kill off as much as 22% of the wild relatives of peanut, potato and beans by 2055. And in March this year, the International Maize and Wheat Improvement Center, known by its Spanish-language acronym CIMMYT, reported that even under optimal rainfall conditions, a temperature rise of a single degree Celsius would cause yield losses for 65 percent of the present maize-growing region in Africa.

Marianne Banziger, co-author of the study and deputy director general for research at CIMMYT, said that a combination of growing drought and heat was expected to occur more frequently in Africa, Asia and Central America, posing "an added challenge to meeting the increasing demand for staple crops on our planet."

Given these immediate threats, perhaps the greatest contribution of the Svalbard vault at present might be to help confront the climate challenge by serving as an ultimate safe-deposit box for seeds to cross-breed hardy characteristics into plants, for example drought resistance. In this way, the growing global effort to bolster crop diversity and seed bank systems is not just to ward off hunger: it is also building a genetic resource to fall back on when new threats to food security arise.

"Seeds are humanity's most precious natural resource", says Dr Cary Fowler, Executive Director of the Global Crop Diversity Trust and current chair of the International Advisory Council of the Svalbard Global Seed Vault. "As threats to agriculture escalate, the importance of crop diversity will only grow".

One more for the freezer: Norwegian technician lugs another seed consignment into the Svalbard Vault for storage

Three urgent steps Though some critics say he is too pessimistic in his outlook, Dr Fowler insists that time is running out. He is not the only worried expert. According to Shivaji Pandey, Director of FAO's Plant Production and Protection Division, "the threat to plant genetic resources continues. They're not being adequately conserved, they're not being adequately collected, and they're definitely not being adequately used."

"Plant genetic diversity is responsible for almost 84% of the food consumed in the world today," Mr Pandey continues. "If there are no plant genetic resources, there will be no food security. And because 75% of the hungry and poor live in rural areas today and derive their livelihoods from plant genetic resources, no plant diversity means no alleviation of hunger and poverty, either."

The FAO recommends that partners in development should take three urgent steps:

- Start collecting those plant genetic resources that have not yet been collected, especially at in situ sites in the centres of origin, meaning the countries and regions where the plants first came from.
- Increase the effort to regenerate and properly store fresh collections of the seeds that already exist in many of the world's 1,750 seed banks. At present, the lack of resources in developing countries puts many of these in situ collections under threat.
- Developing countries should start investing in rebuilding their technical capacity to use plant genetic resources sustainably, including through better agricultural education.

On that last point, the FAO's Shivaji Pandey points out, "developing countries must prioritize this now, and not wait for someone else to do it for them. Only when countries themselves invest resources in something does it show that it's a national priority – and that attracts external funding. If you wait for others, you might have to wait for too long, and you might be too late."

Seeds – and seed data – at risk

Civil war has destroyed seed banks in Iraq and Afghanistan, with much of their contents impossible to replace. In Asia, mudflows triggered by Typhoon Xangsane (Lao for 'elephant') in September 2006 obliterated the National Plant Genetic Resources Laboratory in the Philippines, and about 70% of seed samples stored there were lost for good.

"Safety duplication" of seeds and their storage at distant sites could have prevented such body blows to plant diversity. Yet duplication efforts are lagging, and events again have shown the pressing need for them. Looters in late January 2011 broke into the Desert Research Centre near the small town of Al Sheikh Zuwayid in North Sinai, a few miles from the border with the Gaza Strip and Israel. They vandalized the cooling system, storage areas and laboratories and made off into the night with valuable computer equipment.

The research centre houses the well-respected Egyptian Deserts Gene Bank, which at last count stored about 1,100 accessions, or seed samples, of about 750 wild plant species, including rare medicinal herbs. In 2009, the gene bank was named a Centre of Excellence for the region by Bioversity International.

Following the robbery, the Desert Research Centre announced that, luckily, the looters had left the seed collections largely intact, and that staff hoped soon to resume research. However, it also said that data representing almost a decade of work on the seed collections – and stored in the Centre's IT system – was lost along with the stolen computers.

More reading: The Svalbard Global Seed Vault: Securing the Future of Agriculture. Download 28-page PDF at http://www.croptrust.org/documents/Svalbard%20opening/New%20EMBARGOED-Global%20Crop%20Diversity%20Trust%20Svalbard%20Paper.pdf

PRACTICE

The object of DESIRE: Tackling desertification "the right way"

Combining established science, global reach, traditional knowledge, grass-roots participation, common methodology and a big effort in communication, a USD 13 million EU-funded research effort takes a holistic approach to tackling desertification.

Few international projects in sustainable land management have been more ambitious – or more inclusive. The project has built inventories of traditional knowledge on how to prevent land degradation, mined a variety of existing data bases and then mixed in as much new science as local habits could bear.

Across the "global laboratory" of its 17 study sites, it has brought scientific specialists from a variety of professions face to face with often-balky local farmers and politicians, rolling out demonstrations of land remediation techniques running from minimum tillage, drip irrigation and soil amendment, to green manure, controlled fires and fallow periods ("resting") for rangeland.

A new consensus? It has held scores of stakeholder workshops and churned out manuals, leaflets, videos and policy briefs in different languages as part of a web-based information system of best SLM practices. It hopes to generate useful practical guidelines for a variety of audiences, from farmers in the field to decision makers in ministries and international organisations, on how to make land

Visiting DESIRE scientists at the Institute of Soil and Water Conservation, Yangling, China

management in drylands sustainable. And the project has gathered enough experience since its launch in 2007 to draw up a step-by-step model of "vertical knowledge management" designed to help underpin a new international consensus on how properly to address sustainable land management (SLM).

The project goes by the name of DESIRE. Its premise is that SLM is successful only if it draws upon multiple sources of knowledge, deploys a wide selection of processes and methods and hews closely to continuous monitoring and assessment. Perhaps most importantly, DESIRE says proper SLM stands and falls on how well it meets the needs and wishes of land-users themselves. This bottom-up approach echoes the UNCCD itself.

"Not many projects have deliberately involved stakeholders to the extent we have", says DESIRE spokesperson Nichola Geeson. "Once local people see successful practices that are also sustainable, they talk to their friends and colleagues. That's the best way of spreading the message. For example, if you can convince a local mayor that the science is worthwhile, then you have a chance of disseminating it to people who'll actually use the methodology, not put it on a shelf and forget about it."

The rainfall simulator hall in China's Institute of Soil and Water Conservation: water falling from shower heads in the ceiling onto sloping beds of soil allows controlled study of the effects of runoff and erosion.

Managing complexity DESIRE builds on earlier research foundations developed by the FAO's Land Degradation Assessment in Drylands (LADA), the World Overview of Conservation Approaches and Technologies (WOCAT) programme and the Dryland Development Paradigm (DDP), together with the DIS4ME Desertification Indicator System for Mediterranean Europe and the Pan-European Soil Erosion Assessment (PESERA) model.

The job of managing this complexity has fallen to Professor Coen Ritsema, DESIRE's coordinator and principal of Alterra, part of the Wageningen University & Research Centre in the Netherlands. "Yes, DESIRE is a big, sprawling project and challenging to manage," Prof. Ritsema told UNCCD News. "But combining all available forces is how we must tackle desertification. It's not just about the soil and the environment, it's also about people and reducing poverty and creating new livelihoods."

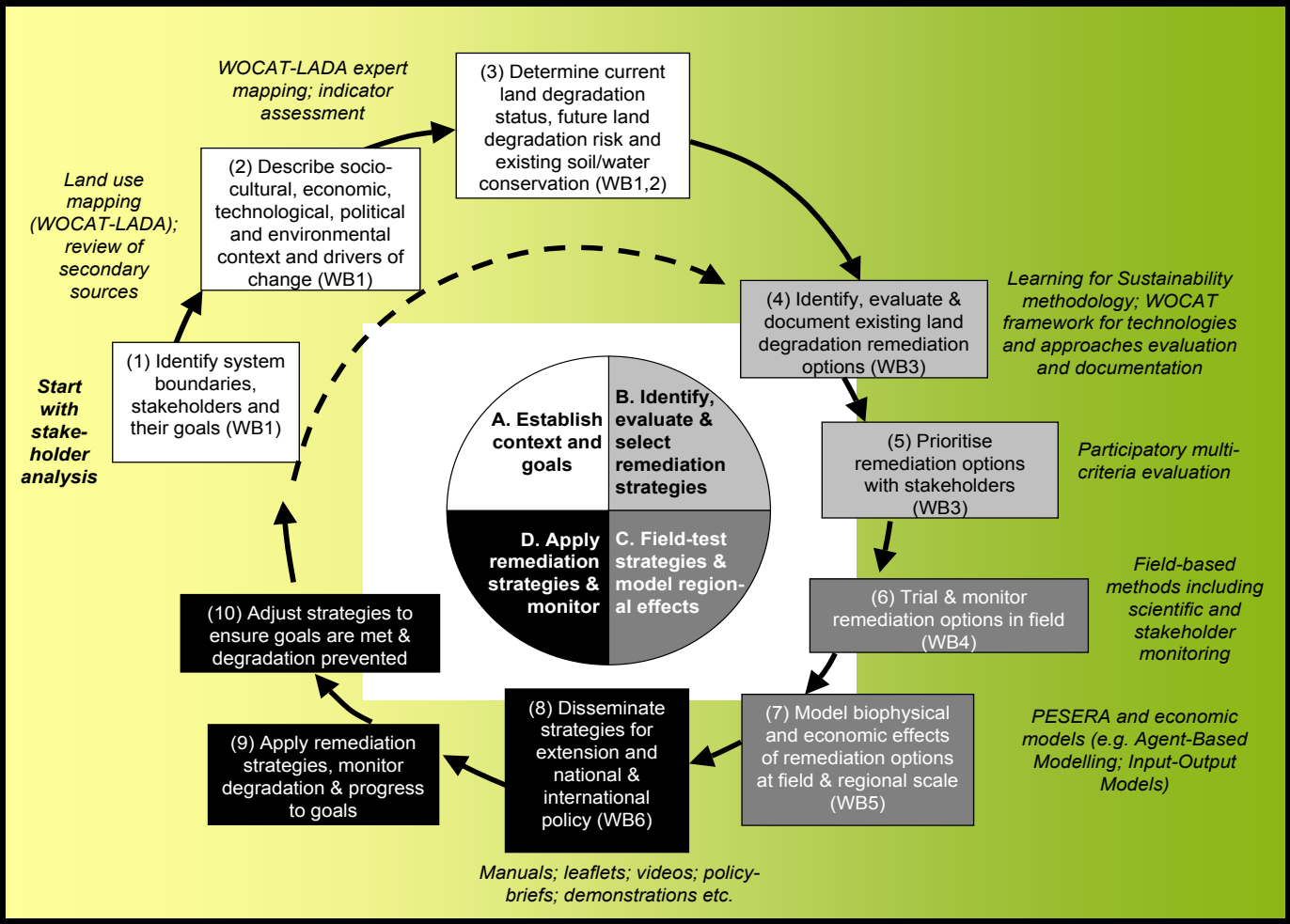
"The complexity is inevitable," Prof. Ritsema continues. "Land degradation is a multi-faceted problem of many causes, demanding a whole array of coordinated solutions. All of us, including policy makers and politicians, have to get used to this fact. However, if we do things the right way, the rewards are very far-reaching."

Listening to the locals DESIRE's multi-stakeholder, multi-method and multi-scale approach is spelled out in an article in Land Degradation and Development (download free-access PDF), published on 25 January 2011. The 31 listed authors of the paper, Coen Ritsema among them, remind us that most integrated approaches to land degradation at the global scale still rely predominantly on indicators selected by the scientific community. They point out that the UNCCD is currently developing a global minimum set of scientific indicators to monitor the implementation of its 10-year strategy (2008-2018).

But just as essential for the article's authors are local needs and knowledge, which facilitate comparisons "across temporal and spatial scales". To actually help people on the ground, they say, any minimum list of indicators must be supplemented with "locally relevant indicators that land managers can monitor and act upon themselves."

DESIRE has found that, in some cases, rural traditions die hard. At a study site in the Guadalentín basin, Spain, its scientists suggested that local land users could allow flowers and grass to grow up

Making things operational



DESIRE's methodological framework, carried out at all 17 study sites, is built around four core themes: 1. Establish land degradation and SLM context and sustainability goals; 2. Identify, evaluate and select SLM strategies; 3. Select land degradation and SLM indicators, and 4. Apply SLM options and monitor land degradation and progress towards sustainability goals.

From these four themes, the framework draws out a Sustainable Management Loop and a Policy Loop, dividing them into a series of methodological steps and outlining the tools and methods that can be used to make each one operational. The framework illustrates how this proceeds from an analysis of the starting point (1) through prioritizing and testing sustainable land management options with stakeholders (5 and 6) to the dissemination of results (8) and adjustment of strategies (10).

With thanks to Dr Mark Reed of the Aberdeen Centre for Environmental Sustainability, University of Aberdeen, and others

between the lines of trees in citrus and almond groves. Mowing them would produce mulch, the scientists said: this could help retain soil moisture in the hottest months and serve as a barrier to erosion. But the land users resisted the measures. Used to the sight of bare ploughed earth between the trees, they complained that the grassy verges looked untidy, adding that they could also catch fire in the dry periods.

Negotiated compromise Similar experiences at other DESIRE study sites over the last four years have helped the emergence of a take-home lesson: not all recommendations based on outsider science are socially, culturally or economically acceptable to land users. Negotiated best-practice may be the final solution.

However, DESIRE's planners also point to results from sites where insistence on innovation convinced local sceptics. DESIRE coordinator Coen Ritsema, a trained soil physicist, says soil amendment products like agricultural surfactants, for example, deserve greater uptake. In comparative trials on treated and untreated plots with identical irrigation in Turkey, DESIRE's use of them appeared to produce a 40-50% gain in crop yields.

The project has also found that, in many ways, big is better. "You need to find the best tools available and establish a large network of experts and organisations working on these topics," says Prof. Ritsema. "There's a real advantage in collecting knowledge through large integrated networks, made up of people with different backgrounds, like agronomists, soil scientists, biophysicists and economists. Getting a lot of these people working together on a five-year platform creates real momentum. The EU's funding of big projects like this with multiple actors is a big step forward. It's using money in an effective way."

Reaching out to business DESIRE is scheduled to come to an official end in January 2012. What happens then? Though development projects often peter out when funding stops, this one will strive to be different. "If we really want to make a difference on the ground," says Prof. Ritsma, "we need to involve more actors. We have the responsibility to properly follow up the knowledge that we've generated. Practising the science is not the end-point."

"We need to establish closer links with industrial partners, for example", he continues. "They need to become more involved in environmental problems and opportunities like this. So our next step is not necessarily another scientific project but trying to work with private-sector companies and consultancies across large areas, supported by governments and organizations like the FAO and the Global Environmental Facility. Scientists will still play an important role, of course, but not so much in the foreground of large-scale implementation projects any more."

DESIRE experts confront evidence of severe hillside erosion due to rainwater run-off – and early evidence of remedial planting for soil fixation

DESIRE's anatomy

Project title: Desertification mitigation and remediation of land - a global approach for local solutions

Funding: The Sixth Framework Programme (FP6) of the European Union, "Global Change and Ecosystems" sub-programme

Start date: 1 February 2007

End date: 31 January 2012

Operating sites: Portugal (2 sites), Spain, Italy, Greece (2 sites), Turkey (2 sites), Tunisia, Morocco, Russia (2 sites), China, Mexico, Chile, Botswana and Cape Verde

Degradation issues: Drought, soil erosion by water and wind, soil salinisation, water scarcity, overgrazing, bush and forest fires, urban pressure

Participation: 26 research institutes and non-governmental organisations (NGOs) including researchers from 17 countries in South and Central America, Africa, Asia and Europe

Budget: EUR 9.03 million (about USD 13 million)

Project coordinator: Prof. Coen Ritsma, Alterra, Wageningen University (WUR), The Netherlands; coen.ritsma@wur.nl

Head of project Professor Coen Ritsma spells out some features

BROWSING

Publications

FAO policy guide: Promoting the Growth and Development of Smallholder Seed Enterprises for Food Security Crops. Case studies from Brazil, India and Côte d'Ivoire. Download 40-page PDF

Science Daily: Biodiversity and Poverty Reduction: Who Controls the Seeds? Read online article

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About the UNCCD

Developed as a result of the Rio Summit, the United Nations Convention to Combat Desertification (UNCCD) is a unique instrument that has brought attention to the land degradation affecting some of the most vulnerable people and ecosystems in the world. The UNCCD benefits from the largest membership of the three Rio Conventions and is increasingly recognized as an instrument that can make an important contribution to the achievement of sustainable development and poverty reduction.
For more information: Awareness Raising, Communication and Education Unit, UNCCD

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