

# Desertification and natural resources, environment, and food security

*If legal instruments are not fully implemented, there is a risk they remain in the domain of virtual reality and wishful thinking. The UN Convention to Combat Desertification (UNCCD) has come a long way since it came into force in 1996, with current membership standing at 191 Parties. 2006 was a landmark year. It was the tenth anniversary of the Convention, and it was also the International Year of Deserts and Desertification (IYDD), declared by the UN General Assembly to increase awareness of this urgent global issue. While progress has been made in tackling desertification, much remains to be done.*

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A major report entitled «The Millennium Ecosystem Assessment» (MA) was released in 2005. Compiled by an international panel of more than 1,000 scientists, it found how humans have modified and degraded the world's ecosystems in the past 50 years and set out to weigh up the consequences of ecosystem change for human well-being.

One of the issues to come under scrutiny was desertification; the report discussed both the problems and possible solutions.

## Compelling reasons for action

It is important at the outset to highlight that desertification, contrary to widespread belief, is a truly global phenomenon, occurring on all continents except Antarctica. A third of the earth's surface is at risk and the livelihood of more than one billion people, or a fifth of the global population, is under threat. The impact of desertification can also be felt thousands of kilometres away from affected countries. To give but one example, visibility in Beijing is often adversely affected by dust storms originating in the Gobi Desert in springtime. Large dust storms emanating from China affect the Korean peninsula and Japan, and can even have an impact on North American air quality. An increase in desertification-related dust storms is widely considered to be a cause of ill health, including fever, coughing and sore eyes, during the dry season.

With incidences of drought, forest fires and sandstorms also on the rise, we cannot afford to ignore the increasing impact of climatic changes which exacerbates

the problem of desertification and its consequences. It is a compelling reminder that the reasons for adopting this Convention ten years ago are more pressing than ever.

## The Millennium Assessment Report

Technological change in our lifetime has been on an unprecedented scale and is continuously shaping our lives. In order to meet growing demands for food, fresh water and energy in recent decades, we have also made unprecedented changes to our ecosystems. At the same time – as city populations grow apace – more and more of us live in environments where nature plays little role and seems of equally little regard. Yet everyone in the world depends on nature and ecosystem services to provide the conditions for a decent, healthy and secure life. As the report points out, however, it is the 2 billion people living in the dryland regions of developing countries who are experiencing the greatest problems from the breakdown in the supply of ecosystem services, being dependent on these services for their basic needs.

## Desertification, ecosystem services, and human well-being

The materials for a secure life for most inhabitants of drylands come from biological productivity. Crop and dairy production as well as livestock and fuelwood all depend on plant productivity, which in drylands is restricted by availability of

## The Millennium Ecosystem Assessment

Desertification is a complex phenomenon with myriad facets. Its political, societal and economic impacts reach far beyond those places where aridity and drought are an everyday feature. The cause to address the challenge of desertification at the global level is strengthened by strong ecological interdependencies with climate change and biological diversity. Moreover, evident interlinkages with food security, rural poverty and migration in the world's dryland regions provide compelling regions for international action.

The Millennium Ecosystem Assessment (MA), a major report on the state of global ecosystem services, recently underscored the crucial links between desertification and global sustainable development. Launched by UN Secretary-General Kofi Annan in 2001 and funded through the Global Environment Facility and others, the MA comprises the interdisciplinary expertise of 1,300 authors from 95 countries.



Photo: Lu Tongjing

Desertification is a global problem: Sandstorms in China also affect the Korean peninsula.

mate change illustrate the multiple benefits to be gained from joint implementation of the UNCCD, the Convention on Biological Diversity and the Framework Convention on Climate Change.

### Impact on food security and poverty

The report clearly points out that persistent, substantial reduction in the provision of ecosystem services as a result of water scarcity, intensive use of services and climate change is a much greater threat in drylands than in non-dryland systems. Most vulnerable are the sub-Saharan and Central Asian drylands. In the Sahel, Horn of Africa and Southeast Africa, for example, severe droughts occur once every 30 years, tripling the number of people exposed to severe water scarcity at least once every generation and leading to major food and health crises. While local conservation practices can mitigate the loss of some dryland services, it will be difficult to reverse the loss of food and water provision services and supporting biodiversity.

Food security is a complex issue, but is fundamentally about soil health, water availability and food production, which are severely jeopardized by desertification. An international symposium organized in Geneva in April 2006 recognized that one of the basic human rights, the right to food, would be much better guaranteed should we be able to successfully implement the UNCCD. In sub-Saharan Africa, which is most affected, many countries are now losing the capacity to feed themselves, turning a continent more than self-sufficient in food at independence over 50 years ago into a massive food importer. These new dependencies are not the way forward.

Global trade regimes and linked government policies significantly influence patterns of food production and consumption and can directly or indirectly affect the resilience of dryland ecosystems. While enlarged markets can contribute to successful agricultural improvements, trade liberalization and raising production for exports can lead to desertification. Greater access to fertilizers, pesticides, farm machinery and to export markets can boost productivity, but access to international markets is determined by international trade regulations. Meanwhile, selective production and export subsidies stimulate the overproduction of many food crops in certain countries, driving down prices thus seriously undermining the livelihood of food producers in poorer countries.

Apart from its association with hunger, desertification is also inextricably linked to

water. While some fluctuation in the supply of ecosystem services is normal, especially in drylands, a persistent reduction in the levels of all services over an extended period constitutes desertification.

When the resilience of a dryland ecosystem is affected, meaning that it doesn't regain its former state, it can result in a downward spiral of degradation. This can take the shape of excessive loss of soil, reduction of vegetative cover, inferior quality and reduced quantity of water, as well as changes in the regional climate system. Dryland people have found ways of coping with periods of scarcity lasting up to several years. However, periods significantly longer than this can overwhelm their resources and ability to cope.

In desertified areas, people have responded to reduced land productivity either by using other marginal land more intensively or by transforming rangeland to cropland. However, both overgrazing and the transformation of rangelands to cultivated systems worldwide have led to the loss of rangeland vegetative cover. This, combined with unsustainable soil and water management practices in the converted rangelands, causes further soil erosion and a decline in soil fertility.

Topsoil is painfully slow to form, but can be destroyed terrifyingly fast. An estimated 24 billion tons are blown or washed away each year, meaning it is being lost at least 16 times faster than it can be replaced. The impact of soil erosion over the last century can be seen in the dust bowls created as a result of destroyed vegetation and wind erosion, from the Dust Bowl of the US Great Plains in the

1930s to the one presently taking shape in the Sahelian region of Africa, where the problem is most acute.

### Desertification, climate change, and loss of biodiversity

Biodiversity, which plays a role in supporting dryland ecosystems, is seriously impaired by desertification. Vegetation is instrumental in soil conservation and in regulating rainfall infiltration and local climate. Different plant species contribute to soil formation and nutrient cycling, while diversity of vegetation species supports both livestock and wildlife. All plants support primary production that ultimately provides food and fuelwood and that sequesters carbon, thus regulating global climate. Excessive exploitation of vegetation, therefore, leads to losses in primary production and hence to reduced carbon sequestration. This disruption of the interlinked services jointly provided by dryland plant biodiversity is a key trigger for desertification and the disappearance of habitats for biodiversity.

The loss of soil and vegetation associated with desertification in turn affects global climate change. Dryland soils contain over a quarter of all organic carbon stores in the world as well as nearly all the inorganic carbon. As a result of desertification, some of this carbon is released into the atmosphere, thus affecting the global climate system. It is estimated that 300 million tons of carbon are thus released every year. These close interconnections between desertification, biodiversity loss and cli-

poverty. According to the MA report, «desertification is potentially the most threatening ecosystem change impacting livelihoods of the poor.» The link was spelled out at the World Summit on Sustainable Development in Johannesburg in 2002, which recognized the Convention as one of the key instruments for poverty eradication, the first of the eight Millennium Development Goals (MDGs). Currently, approximately 1.2 billion people, or one in every five of the world's population, are living in extreme poverty, which means struggling to survive on less than one dollar per day. A salient feature in these statistics is the rural nature of poverty. Approximately two-thirds of the world's poor live in rural areas, a large majority of them depending on agriculture for their daily subsistence. Forced to over-exploit the land, for food, energy, housing and income, the poor become both the cause and victims of desertification. Therefore combating desertification also contributes significantly to a reduction in global poverty, thereby playing a crucial role in achieving the MDGs.

### Better practices through empowerment of the rural poor

The creation of a culture of prevention can go a long way towards protecting drylands from desertification. However, it requires a change in governments' and peoples' attitudes through improved incentives. The rural poor are rarely in a position of power over natural resources. Instead, they are held back by political marginalization, lack of legal ownership and exclusion from the decisions that affect how these ecosystems are managed. Rural women in particular were often unable to obtain credit and access to advisory services that could have helped them improve their land use practices. Measures to conserve natural resources have brought more results, on the other hand, when local communities are given ownership of the resources, share the

### International Year of Deserts and Desertification

2006 has been designated International Year of Deserts and Desertification in an effort to curb desertification around the globe. However, it also sought to celebrate the unique ecosystem and cultural diversity of deserts worldwide. A wide variety of events worldwide marked the Year.



Photo: Chelal

Desertification has a serious impact on food security. In recent years many desert prone countries have become food importers.

benefits, and are involved in decisions. This so-called 'bottom-up' approach, which entails the full involvement of local populations from the decision-making process through to implementation, is a guiding principle of the UNCCD. The MA report pointed to evidence from a growing number of case studies which demonstrates that dryland populations can stay ahead of desertification by improving agricultural practices in a sustainable way. In many areas of the Sahel region, for example, land users are achieving higher productivity by capitalizing on improved organization of labour, more extensive soil and water conservation, increased use of mineral fertilizer and manure and new market opportunities. The report also emphasized that the restoration of ecosystem services lost due to desertification can be achieved through a positive change in the interaction between people and ecosystems, and further stressed the crucial importance of involving rural communities in these efforts.

### Dryland opportunities

One means by which desertification can be avoided is by turning to alternative livelihoods that do not depend on traditional land use, yet provide sustainable income. Most drylands indeed offer tangible economic opportunities to alleviate the currently prevailing poverty. These include dryland aquaculture for the production of fish, greenhouse agriculture and tourism-related activities. Desertification can further be avoided by creating economic opportunities in dryland urban centres through commercialization of agricultural products and a decentralized food processing infrastructure. This is particularly relevant when considering that the urban section of drylands is projected to increase to around 52 percent by 2010 and to 60 percent by 2030. The UNCCD, through its National Action Programmes (NAPs) is actively engaged in

a number of projects in this field in different parts of the world. The Convention recognizes that since desertification is a complex phenomenon, it must also be tackled in ways tailored to the specific needs of each individual country. Several notable projects are being implemented involving young unemployed people in Mozambique, Lesotho, and are about to be launched in Latin America. The aim is to create employment for young people in both rural and urban areas through a wide range of environmental rehabilitation services such as planting of trees, fruit orchards, waste collection and recycling; simultaneously improving biodiversity in the area, food security and generating much-needed income.

### International cooperation

«OIKOS», in Greek, means the House, the one house in which we all live. «Ecology» means the principle that governs the house; «economy» means the rule that applies to that same house but the rule must respect the principle. This planet is our house and there is no escape from it, nor from the world's environmental challenges. In order to meet the threat of desertification, there will have to be international cooperation across all national boundaries on a much larger scale than we have seen up to now. The issue of desertification, as has been illustrated, is not a fatality. Technical solutions exist. Response policies have been identified. What we need is greater consciousness and political will. In this regard, we hope that the IYDD will help raise the visibility of the issue on the international agenda. Desertification is an issue that affects us all, directly or indirectly, and just as it is largely man-made, it is within our power to do something about it. The Secretariat of the UNCCD stands ready to continue its service to Parties through policy advice and in the consultation and monitoring processes.