

Desertification control in China – a formula for success?

Despite ambitious desertification control programmes, the area of desertified land has expanded continuously since the establishment of the People's Republic of China, with increasingly serious impacts on important industrial and settlement areas. Only in the new millennium is a reversal of this trend in sight.

China is no longer under threat from hostile nomads or foreign powers but from dust and sand. The «yellow dragon» – the poetic name for the season of violent dust-storms early in the year, which used to rear its head perhaps once a decade – now descends on the capital, Beijing, on an annual basis. The sky darkens, the air turns yellow and red, dust clogs machinery and chokes people, and outdoor life is brought to a virtual standstill.

In the winter half of the year, a cold-high forms over Siberia and Mongolia bringing air masses down from Central Asia towards the Pacific. The winds whip up loose masses from the deserts and steppes which have been deposited as loess over millions of years. However, the masses of sand and dust transported by the wind are increasingly a source of pollution for large areas of northern China and beyond. Human activities, i.e. inappropriate land use, have magnified the natural consequences of wind erosion. The result is desertification, now a problem not only in the central Asian region of China but increasingly also in northern China's coastal regions.

Changing perception of the desertification phenomenon

The shifting emphasis of government programmes reflects the Chinese leadership's changing views on desertification:

- 1949-1978: Under Mao, nature was expected to bend to the will of people; central features of this period were Han migration and the development of new land in arid regions, disregarding ecological concerns.
- 1978-1994: Efforts began to control wind erosion with the launch of the «Great Green Wall» afforestation project. Up until 1994, the term «desertification» was rendered in Chinese as «sand desertification or sand encroachment»;
- Mid-1990s: Upon joining the United Nations Convention to

Combat Desertification (UNCCD) in 1996, the People's Republic of China also adopted the Convention's definition of desertification; desertification monitoring and pilot projects were driven forward with international cooperation;

- In the new millennium, more radical measures, such as a total grazing ban, have been imposed on a wide scale. In the Desertification Control Law of 2002, the definition of desertification is very broad in geographical terms, and thus goes much further than that used in the Desertification Convention; nevertheless it is made clear that the predominant emphasis is on controlling wind erosion.

The extent of desertification

The area affected by desertification in arid regions (including existing deserts) amounts to some 2.6 million square kilometres (km²), which is 28 percent of Chinese territory or 80 percent of China's dry-land areas. This is seven times the area of a country like Germany. Wind erosion is the principal manifestation, responsible for the loss of 1.6 million km², followed by degradation resulting from water erosion (0.2 million km²) and salinization (0.2 million km²). 97 percent of desertified areas are in the north and northwest, in just ten provinces and autonomous regions. Since the 1950s, the area of desertified land has grown from 1,600 km² to far in excess of 10,000 km². By comparing results from the last two national desertification studies, in 2005 for the first time the govern-

Between 2000 and 2004, for the first time in the existence of the People's Republic of China, the area of desertified land diminished by almost 1,300 square kilometres per year.

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ment had scientific evidence to back an announcement of positive progress on desertification control. This indicated a reversal of the trend, albeit a modest one. The vast extent of desertification can be illustrated with the following facts:

- All together, 400 million people or 30 percent of the total population are directly or indirectly affected.
- 7.73 million hectares of arable land are under threat, degraded or lost; several hundred million hectares of pasture and steppe land are degraded. This is joined by far-reaching destruction of relatively small-scale ecosystems such as those found in forests.
- Tens of thousands of water management facilities are threatened by wind erosion and sanding up;
- The drying out of inland lakes in the desert leads to the forced abandonment of traditional oases;
- Desertification as a result of water erosion is causing major damage, particularly in the transition zone between the Loess Plateau and the Ordos Plateau, and is a very significant source of sediment load in the Yellow River.

The consequences of desertification include rapid decline in productive arable land and reduction of the ecosystem services provided by vegetation; constraints on the quality of life in urban industrial growth zones and higher costs of maintaining physical infrastructure; and, above all, an increase in rural poverty and environmentally-induced migration.

The damage has taken on international proportions. Fine sediments from dust and sandstorms are already reaching the American west coast. These sandstorms are having health impacts in the east and in the southern part of China as well as Japan and Korea. One factor about which knowledge remains inadequate is the influence of desertification on global climate change.

The annual costs of desertification are estimated at between 54 billion renminbi (RMB), equivalent to 5.4 billion euros, and 83 billion RMB (8.3 billion euros).

Forces driving desertification

Key direct factors are land consumption, inappropriate land and water use, particularly in the steppes and desert steppes, and present-day climate change. Indirectly, population growth, economic policy and legal conditions, socio-political framework conditions, science and technology all contribute to desertification. Land degradation is accelerated by cropping activities on marginal sites without taking any soil protection measures.

Large-scale irrigation for crops with low economic value but high water requirements, coupled with water mismanagement causes salinization which is affecting a total area of 20,000,000 hectares. In the wake of rapid population growth (from 550 million people in the 1950s to over 1.3 billion in the year 2005), the demand for food, fuelwood, construction timber and livestock feedstuffs has surged. Unfettered economic development (a growth-at-all-costs industrial model) since the 1980s is hastening the advance of desertification still further. For example, in response to market demand in the 1990s, the number of livestock in China more than doubled in just a decade, but without adapting stock-raising methods in dry areas (e.g. introducing rotation, indoor livestock management). Overgrazing was the result.

Often, too many different interests (state farms, small farmers, forestry, road building and nature conservation), unclear divisions of responsibility and conflicts of interest between upstream and downstream riparians, block attempts to institute rational water and soil management.

Desertification control programmes

Institutions, laws and action plan. In response to the environmental threat of desertification, the People's Republic of China has improved its institutional and legal framework conditions; since 2002 there has been a Law on the Prevention and Control of Desertification. A National Action Plan to Combat Desertification

German-Chinese cooperation

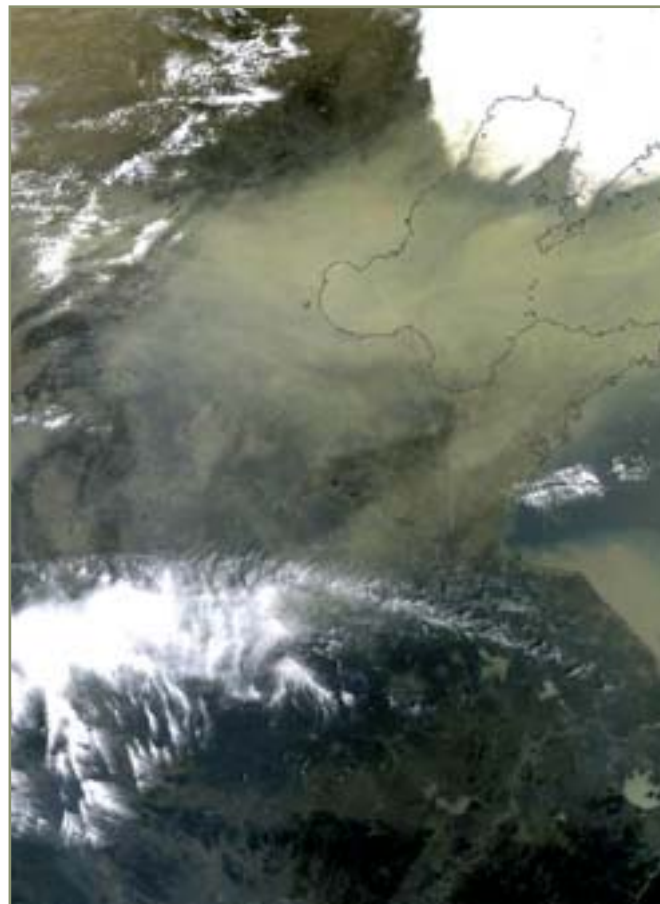
Germany is currently the largest bilateral donor in the Chinese forestry sector with more than 20 projects. For example, the KfW Entwicklungsbank (KfW development bank) has co-financed 15 projects on desertification control since the mid-1990s. Of these, two address poverty and 13 are integrated forest and resource conservation projects.

The contribution made by German financial cooperation to desertification control amounts to 91.3 million euros. Accounting for 65 percent of inputs for all forestry projects, desertification control is the major focus of forestry cooperation.

(1996-2050) was produced within the context of China's Agenda 21 for sustainable development. A National Committee for the Implementation of the UNCCD has a Permanent Secretariat and three centres for research, monitoring and training.

The Great Green Wall, as the «Three Norths» shelter-belt programme (duration 1978–2050) is known, is probably the largest environmental programme worldwide. Conceived as a fortification made from trees, it was China's first major desertification control programme. The strips of forest consisting of millions of trees protect valuable farmland against wind erosion, but cannot actually prevent the sandstorms.

National Action Plan (NAP): The priority of the first phase of the plan (1996–2000)



On 21 April 2006 Beijing was covered with a 300,000-tonne blanket of sand and dust – the severest sandstorm for five years. The dust is not from pre-existing deserts. It comes from parts of China where no desert originally existed but which human activity has laid to waste in recent decades.

was to record the damage, train workers and set up demonstration stations. The goal is essentially to halt the advance of desertification by 2010 and, by consolidating the success achieved, to reduce the area threatened by desertification year-on-year from 2030, so that by the year 2050 all human-induced desert should be rehabilitated.

The current National Plan to Prevent and Control Desertification (2005–2010) provides for sustainably improving environmental conditions and controlling 13 million hectares of desertified land. This corresponds to an area the size of Greece. Due to the particular features of the different landscapes, the Plan distinguishes between five desertification risk regions. Although a specific package of measures is being developed for each region, they all centre on excluding human activities from the area and a total grazing ban in order to speed up the rehabilitation of the degraded vegetation. In locations especially at risk of desertification, people are being resettled in order to prevent future damage. Incentive systems have already been piloted and are now being rolled out on a large scale. They include:

- Land conversion, i.e. reconverting arable and grazing land on marginal sites, which include steep slopes, grass and tree crops and forest; under this scheme the farmers receive compensation payments.
- Total grazing ban coupled with the implementation of indoor livestock farming and the creation of alternative sources of work and income.
- For private investors who «invest in desertification control», new instruments are anticipated such as tax exemption and access to low-cost loans. Furthermore, the statutory basis

has been created for paying for the ecological services of vegetation. Other than in the city of Beijing, as yet barely any ecological compensation funds exist to pay farmers for ecological services such as the conservation and management of vegetation in ecological forests.

Within China there is increasing emphasis on the necessity for good governance and civil society participation in desertification control. Non-governmental organizations such as the China Sand Control and Desert Society are the exception rather than the rule in China.

Regional development and desertification prevention

It is mainly in the poor Western Region of the country that desertification is a key problem. Hence desertification control is seen as just one of many problems to be solved in the context of sustainable regional development in high-risk or potentially threatened regions. The Chinese government has therefore developed a comprehensive regional plan for the Western Region. This integrates both poverty reduction projects and a Local Area Development Program (LADP).

Is the future secure?

The Chinese approach in the new millennium is characterized by:

- the implementation of radical measures like the wide-scale grazing ban;
- the integration of desertification control into regional development in the west of the country;

- wind erosion control in all climatic zones affected;
- improved water resources management and integrated management of smaller watersheds; and
- a stronger emphasis on prevention.

With this approach, for the first time since the founding of the People's Republic of China, the constant spread of desertification has been halted. However, activities to regenerate vegetation by excluding people and animals coupled with conversion to different management practices run up against limitations wherever they infringe on cultural values and traditional ways of life (e.g. those of the nomads in Tibet and Mongolia), and where the financing of protection and management conversion measures is not secured.

It will thus be critical for long-term success to motivate the affected farmers and herd-owners as well as private investors by offering suitable incentives to play a far greater part in the regeneration of vegetation cover and conversion to environmentally benign and sustainable farming methods.

Very soon the efforts to achieve sustainable development in the regions threatened by desertification could be threatened still further by climate change. The race cannot be won by battling against nature, but instead, only with a «peace convention with the desert». The harmonization of society and nature is also an objective of the Chinese Ten-Year Plan (2000–2010). In desertification prevention and control, China will undoubtedly continue to achieve major success in some areas. Yet it is a task of unprecedented proportions and there is little expectation that the «yellow dragon» will be laid to rest any time soon.

Success with grazing ban

China has 400 million hectares of natural grassland (42 % of its land area). However, 80 percent is degraded or sanded up due to overgrazing. According to information from the national grazing monitoring centre, over 71 million hectares (twice the area of Germany) of natural pasture land will be covered by the temporary total grazing ban for several years. This means conversion to indoor raising of more than 20 million farm animals. In the period 2005–2010 China will spend around 26 billion RMB (2.6 billion euros) on restoring 660 million hectares of grassland.

In pilot projects, after three years of the grazing ban in Inner Mongolia, the vegetation rate increased from 20 percent to over 60 percent. Local sandstorms have declined appreciably, and grass yield has risen from 450 kilograms to 1,500 kilograms by virtue of the grazing ban. The ban is the right policy, but the sustainability of its positive results will be in jeopardy if the ban is modified without introducing a sustainable pasture management system, and unless livestock farmers are supported in generating a stable income.



Photo: Kuchelmeister