

Aggravating Desertification in Africa

~Its Spacious Assessment and Countermeasures



Discussions on monitoring and assessment under the UN Convention to Combat Desertification (UNCCD)

【 Provisions under the Convention 】

To support and further develop bilateral and multilateral programs and projects aimed at defining, conducting, assessing and financing the collection, analysis and exchange of data and information, including, inter alia, integrated sets of physical, biological, social and economic indicators (UNCCD Art.16.c)

【 Background of the discussions 】

Benchmarks and indicators that are a basis for monitoring and assessment, and early warning systems have been discussed by the Committee on Science and Technology (CST), which is established as a subsidiary body of the Conference of the Parties of UNCCD (United Nations Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa) to provide it with information and advice on scientific and technological matters relating to combating desertification and mitigating the effects of drought, the Ad Hoc Panel and the Group of Experts (GoE), which have been established under the auspices of CST.



A report on benchmarks and indicators was submitted during the eighth session of the Conference of the Parties to UNCCD (COP8, held in Madrid, in September 2007), and it was decided at the ninth session of CST in Buenos Aires (in September 2009), to convene its sessions in the scientific conference-style format and to promote further scientific discussion on 'Bio-physical and socio-economic monitoring and assessment of desertification and land degradation, to support decision-making in land and water management'

Contributions made by the Ministry of Environment, Japan, to the monitoring and assessment of desertification and land degradation

Examined methodologies for the monitoring and assessment of desertification and land degradation in Asia, and reported its research outcome to the UNCCD/CST (CST8, Madrid, September 2007).

(Its overview of result is presented on page 5.)

Promoting the monitoring/assessment of desertification and land degradation in Africa and combating desertification in fields



Desertification assessment in Africa

Based on the methodologies examined in the aforementioned research, undertook desertification assessment in Africa, which is a primary target region under UNCCD (Assessed water erosion, which is the major direct factor for desertification. Implemented 2008-2009. Methodologies described on page 2. Outcome presented on pages 3 and 4.)

Spatial and temporal monitoring and assessment of water erosion.

The Ministry of the Environment (MOE), Japan, has undertaken desertification assessment in Africa since FY2008, based on methodologies reported in the research funded by its Global Environment Research Fund. It has, in particular, estimated the areas that have been experiencing serious water erosion from the 1980's to the early 2000's. Water erosion is the most significant factor for desertification.

Water Erosion

Water erosion is a phenomenon where soil is drained off the ground surface by rain or run-off. Erosion takes place first, at the surface level, by rain or run-off (Surface erosion), creating a ditch (Rill erosion), and expanding the ditch (Gully erosion). Water erosion often takes place in farmlands or bare lands and rarely occurs in forests.



[Sheet erosion]
Soil drainage in sloping cultivation land

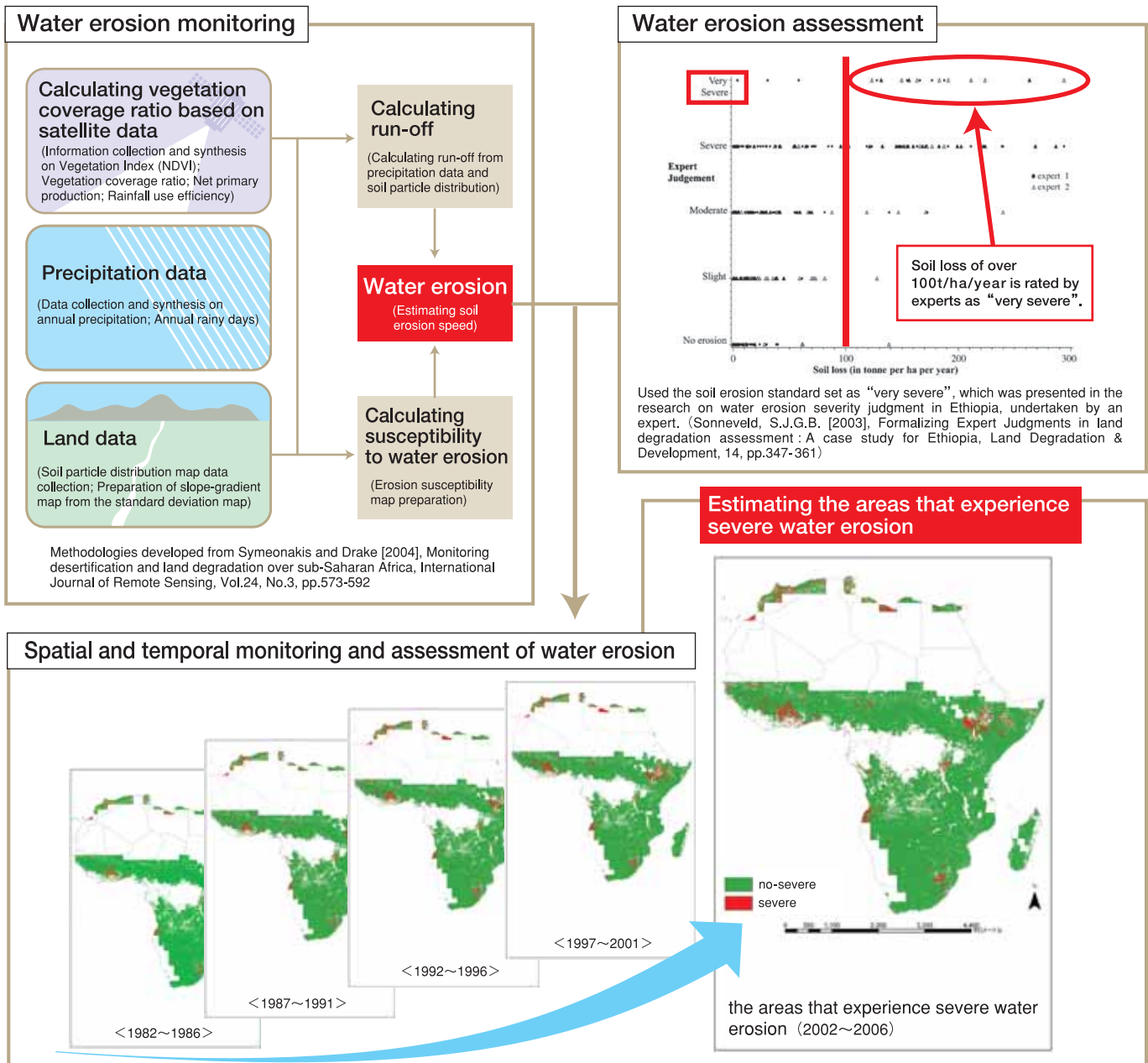


[Rill erosion]
Ditch creation in areas of run-off concentration



[Gully erosion]
Small ditch turns into gully

Photo taken in Nazret, Ethiopia, Feb. 2010

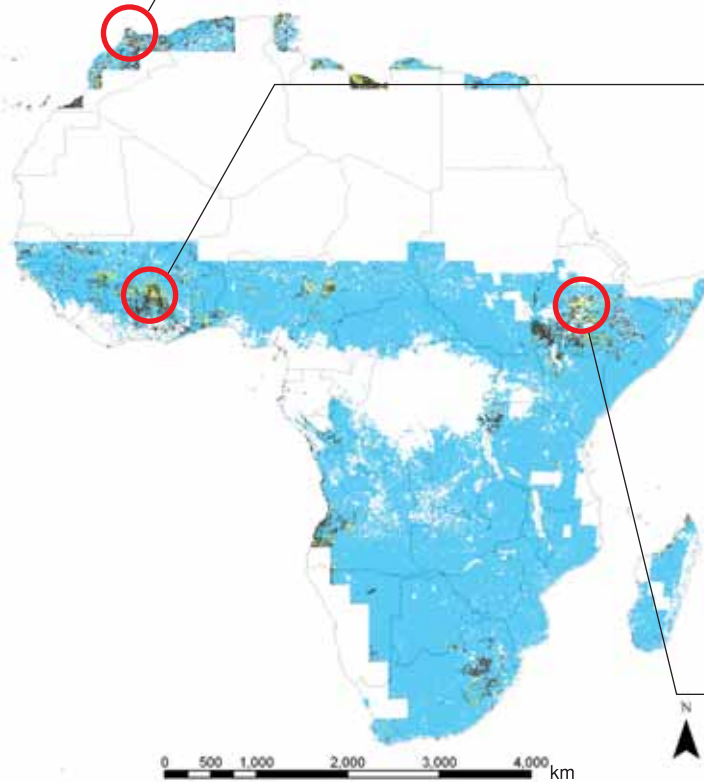


State, factor and countermeasures of water erosion in Africa

Anthropogenic countermeasures in the areas susceptible to water erosion

The areas affected by severe water erosion

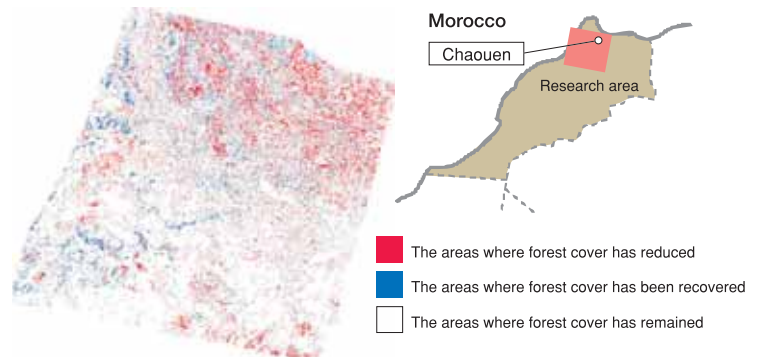
It estimated the areas where spatial and temporal water erosion had taken place in the period from the 1980's to the early 2000's; presumed the areas where severe water erosion had taken place, consecutively, since the 1980's and those areas where erosion had newly occurred in the 2000's.



- The areas where severe water erosion had taken place since the 1980's
- The areas where severe water erosion had newly occurred in the 2000's
- The areas where water erosion become NOT severe in the 2000's
- The areas where severe water erosion had NOT taken place since the 1980's

Morocco (in and around Chaouen)

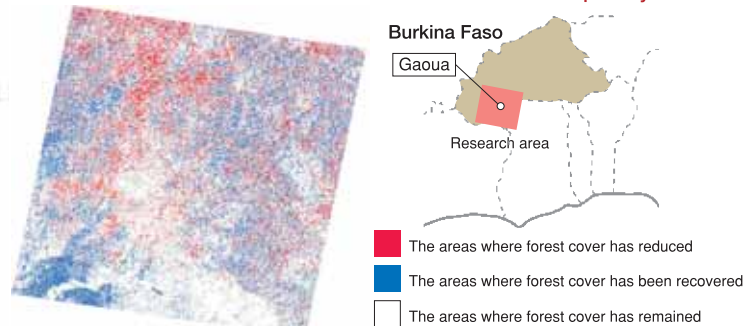
In and around Chaouen, forests have been destroyed to reclaim crop and olive farms. These factors have prompted water erosion.



Forest change in and around Chaouen from 1980's to 2000's based on LANDSAT
Farmland reclamation, housing-area expansion and forest fires have induced deforestation. Reforestation has been undertaken and forests have been restored in some areas.

Burkina Faso (Southwest Region)

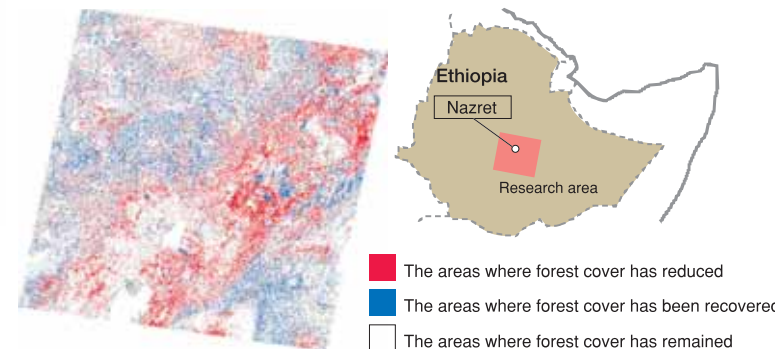
In the Southwest Region of Burkina Faso, farmland is reclaimed for cotton and food production, by migrants from the northern part of the country. Forests have also been reduced. Such factors enhance water erosion susceptibility.



Forest cover changes in the Southwest Region of Burkina Faso from the 1980's to the 2000's, based on LANDSAT
Migration from other areas has been drastically increasing and has been prompting land use change and deforestation in the northern part of the country which already faces severe drought and land degradation; also in neighboring Cote d'Ivoire, which witnessed civil wars in 2002, and in the Southwest of the country.

Ethiopia (in and around Nazret)

In and around Nazret, it is impossible to revive fallow land due to climatic factors such as heavy rains, population growth and livestock trampling on farmlands. These factors increase the susceptibility to water erosion.



Forest cover changes in and around Nazret from 1980's to 2000's based on LANDSAT
When the monarchy system was converted to a socialist state in 1974, land-use rights were distributed and many forest areas were converted into farmlands. Ever since, deforestation continues, due to farmland reclamation and livestock increase, which are prompted by population growth. These factors increase the susceptibility to water erosion.

Field survey was conducted in areas where severe water erosion was estimated to have started taking place in the 2000's (Burkina Faso, Ethiopia and Morocco, in February, 2010). This presents the status of water erosion, countermeasures and the required international cooperation based on the outcome of the field survey.



Water erosion in and around Chaouen. Water erosion is not observed in areas on the right and left where forests still remain. However, the areas where forests have disappeared are experiencing increasing water erosion.



Livelihood-improvement activities by the Chaouen local government through sustainable forestry management, with forest certificates obtained from FSC (Forest Stewardship Council). Cork Oak (Quercus suber L.) (above) and transporting barks of oak trees which are used as material for producing cork

International cooperation required for combating desertification at the field level

The following opinions were expressed in the interview survey with experts, government officials and NGOs, with regard to required international cooperation:

- In addition to spatial monitoring, monitoring with the participation of local communities is required for demonstrating concrete countermeasures to the local people
- Support to share knowledge and information on traditional indigenous technology used effectively to combat desertification in other countries and regions
- Presenting scientific mechanisms of desertification and useful countermeasure technologies and undertaking technical training for the stakeholders involved in combating desertification at the field level
- Need for long-term and continuous assistance to combat desertification, as it doesn't offer results immediately



Erosion in Gaoua (above). Slush and burns for cotton farm reclamation; Branches taken home to be used as fuel (below)



Collective farms managed by a women's association, DELWENDE, in Gaoua. The contour stone lines are laid to prevent water erosion and medicinal trees are planted in the fields.

International cooperation required for combating desertification at the field level

The following opinions were expressed in the interview survey with experts, government officials and NGOs, with regard to required international cooperation:

- Support to disseminate information on measures to combat desertification within the area (Differences in language and illiteracy are impediments to propagating knowledge on countermeasures to desertification)
- Financial, in-kind and technology support to transfer technology to combat desertification
- Support to share conventional technology used for combating desertification in other areas
- Support for promoting coordination and sharing of information among aid countries and agencies for implementing efficient



Water erosion around Nazret (above). Farmers said that farmlands are lost by 2m every year due to severe water erosion (below). In addition, they have to often bear losses when their livestock fall in gullies and die.



Ditch is built along the contour lines as a countermeasure to reduce water flow velocity in areas where sloping cultivatable land pervades.

International cooperation required for combating desertification at the field level

The following opinions were expressed in the interview survey with experts, government officials and NGOs, with regard to required international cooperation:

- Cooperation in research and studies with regard to technology used in daily life for combating desertification
- Financial and technical support to transfer and propagate technology for combating desertification, and to promote model projects that demonstrate the technology's impact to the community
- Promotion of information sharing among experts to undertake inter-disciplinary approaches to combating desertification (e.g. Promoting research from the point of view of natural resource management)
- Support to share conventional technology used effectively in other regions to combat desertification

Cooperation to desertification by Japan

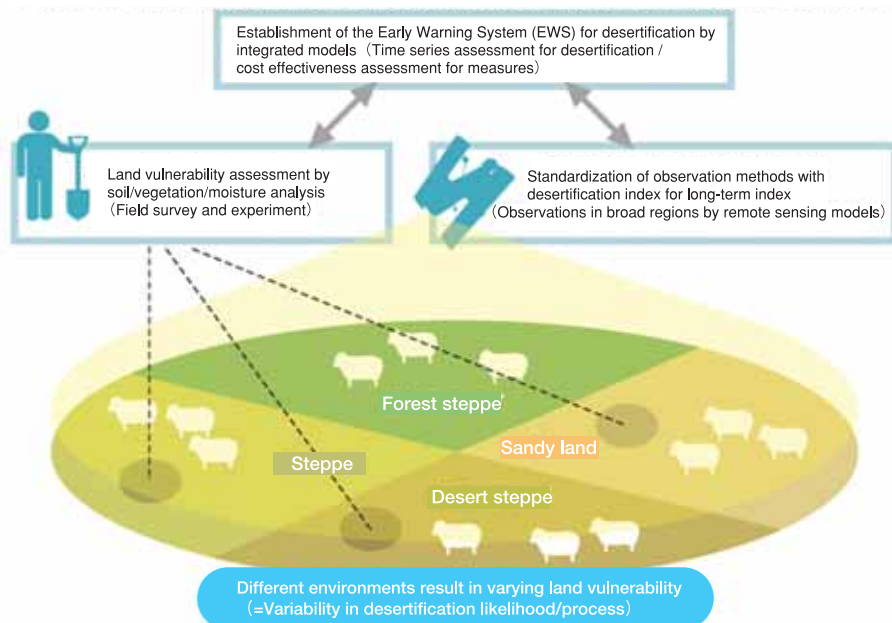
Research on monitoring and assessment of desertification

“A Pilot Study for Desertification Assessment and Establishment of an Early Warning System in North-East Asia”, funded by the Global Environment Research Fund of the Ministry of Environment, Japan.

Research Framework

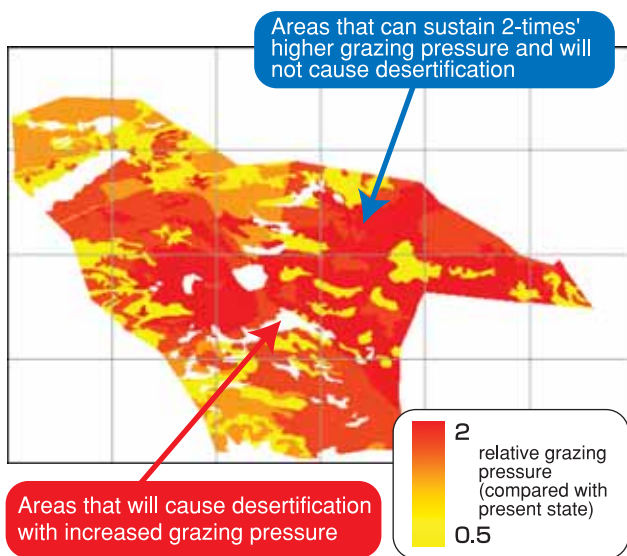
By conducting spatial analysis with remote sensing and field survey, the research aimed to integrate soil, vegetation and moisture-level analyses, and to conduct temporal assessment of desertification and evaluate cost-effectiveness of countermeasures. It thereby attempted to analyze land use that prevents desertification and to conduct cost-effectiveness analysis on desertification countermeasures.

A Pilot Study for Desertification Assessment and Establishment of an Early Warning System in North-East Asia



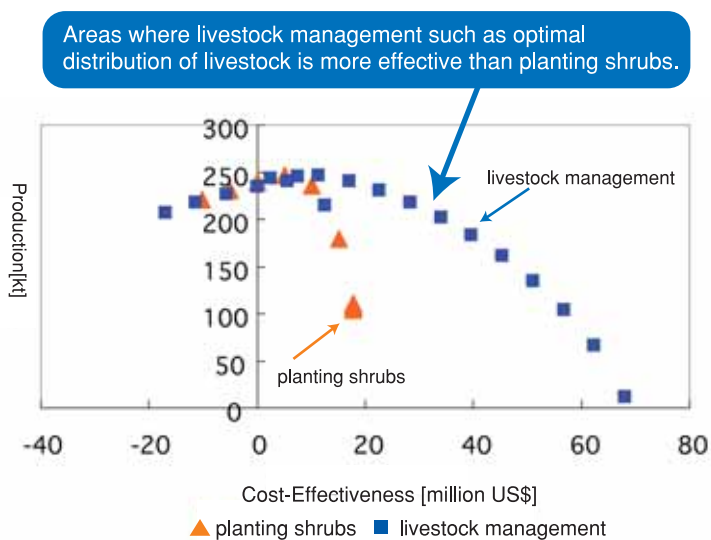
Project leader: Dr. Kazuhiko Takeuchi, Graduate School of Agricultural and Life Science, The University of Tokyo
 Project period: 2004-2006 (fiscal year)
 Project site: China, Mongolia

Analyzing land use to prevent desertification



Distribution of maximum grazing pressures without causing desertification (=Grazing pressures that maximize livestock revenues while maintaining sustainability) ※Diagram indicates Saintsagaan soum, Dundgovi Aimag, Mongolia

Analyzing cost-effectiveness of countermeasures



Production of palatable grass and benefit/loss correlation
 ※ Analysis in Saintsagaan soum, Dundgovi Aimag, Mongolia

Reference: Website of Ministry of the Environment, Japan (http://www.env.go.jp/en/earth/research/gerf_E/index.htm)

Agreements/Recommendations on Monitoring and Assessment by the UNCCD 1st Scientific Conference held at the 9th Session of the Committee on Science and Technology

At the 9th session of the Committee on Science and Technology (CST9, September 2009, Buenos Aires), the UNCCD 1st Scientific Conference was held to advance scientific discussions to address the topic of 'Bio-physical and socio-economic monitoring and assessment of desertification and land degradation, to support decision-making in land and water management'.

At the Conference, the following key messages/recommendations were adopted.

Abstract: Key Messages/Recommendations on monitoring and assessment by the 1st Scientific Conference

- Need for a rigorous scientific framework for monitoring and assessment
- Need to integrate Desertification, land degradation and drought (DLDD) monitoring and assessment into Sustainable land management (SLM) monitoring and assessment
- Need to provide scientific information on monitoring and assessment in a way useful to decision-makers
- Need to develop human and institutional capacities for monitoring and assessment
- Need for mechanisms to share and disseminate methodologies and knowledge on monitoring and assessment

Recommended International Cooperation for Combating Desertification

In the interviews with stakeholders involved in combating desertification, during the field research on water erosion undertaken in Burkina Faso, Ethiopia and Morocco in FY2009, the following opinions were expressed on the international cooperation required for promoting activities to combat desertification:

- ① **Multifaceted support for monitoring and assessment of desertification and land degradation**
 - Promoting monitoring and assessment to identify spatial priority areas for combating desertification and land degradation using satellite and weather station data
 - Promoting monitoring and assessment to conduct concrete desertification assessment in boundary areas with the participation of local stakeholders
 - Support for capacity development to conduct aforementioned monitoring and assessment in countries and areas affected by desertification
- ② **Promoting the research and study of technology for combating desertification**
 - Promoting research and study of technology to combat desertification which will be useful in the daily lives of the local people in areas affected by desertification
- ③ **Support to disseminate technology for combating desertification (including countermeasures used in various sectors related to desertification)**
 - Support for machines and equipment for promoting transfer and dissemination of technology for combating desertification
 - Scientific and technical support to adjust the technology for combating desertification to the socio-economic and environmental conditions of assisted communities
 - Promoting model projects to demonstrate the technology's potential to stakeholders in a comprehensible manner and to promote its dissemination in affected areas
 - Strengthening policy support for development, agriculture and industry policies, in order to disseminate and promote effective technology
- ④ **Support to share knowledge, experience and recognition on combating desertification**
 - Support to share knowledge and information on conventional and local technology which is effective in combating desertification in affected areas of various countries and regions
 - Support to promote the integration and interface of scientific knowledge of various disciplines with the view to combating desertification from regional and holistic viewpoints
 - Support for education and promotion of environmental learning in order to overcome challenges in information sharing, such as illiteracy and multiple languages, and to communicate with local people on desertification issues in a comprehensible way

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