

## 2.2 Research Projects

### 1) Division of Arid Land Environment

#### Subdivision of Natural Environment

Studies on the wind climate and sand movement in the Tottori Sand Dune

Allocation from the University Funds, since 1991

Analysis of ground surface information by remote sensing

Allocation from the University Funds, since 1991

Studies on the modification of microclimate of agricultural fields

Allocation from the University Funds, since 1997

Studies on the monitoring of desertification in the Loess Plateau, China

21<sup>st</sup> Century COE Program Funds from the Ministry of Education, Culture, Sports, Science and Technology, 2002-2006

Researches on combating desertification and developmental utilization in inland China

Funded by the Core University Program (headed by A. Tsunekawa), 2001-2010

Study on the resilience of a Mongolian grassland ecosystem from an experimental drought

Funded by Grants-in-Aid for Scientific Research from the Japanese Ministry of Education, Science, Sports, and Culture (headed by M. Shinoda), 2004-2006

Project for development of human capacity for weather forecasting and data analysis in Mongolia

Funded by the Japan International Cooperation Agency, 2004-2008

Analyses of variations of glaciers and glacial lakes using satellite images: Comparison between the monsoon and arid Asia

Funded by Grants-in-Aid for Scientific Research from the Japanese Ministry of Education, Science, Sports, and Culture (headed by S. Iwata), 2005-2006

Development and analysis of database for establishment of an early warning system of meteorological disasters in Mongolia

Funded by Grants-in-Aid for Scientific Research from the Japanese Ministry of Education, Science, Sports, and Culture (headed by Y. Morinaga), 2005-2006

Rise-and-fall history of nomadic dynasties in terms of interaction between human activity and environmental change

Funded by the Research Institute for Humanity and Nature (headed by N. Shiraishi), 2006

Assessment of influence of construction on dividing habitats of endangered ungulates

Funded by Grants-in-Aid for Scientific Research from the Japanese Ministry of Education, Science, Sports, and Culture (headed by A. Tsunekawa), 2006-2009

Environmental archaeological study on the history of ruin of the Mongolian empire

Funded by Grants-in-Aid for Scientific Research from the Japanese Ministry of Education, Science, Sports, and Culture (headed by N. Shiraishi), 2006-2009

#### Subdivision of Water Resources

Design of irrigation systems and water management

Allocation from the University Funds, since Apr. 1993

Estimation of crop transpiration and soil evaporation

- Allocation from the University Funds, since Apr. 1993
- Up-scaling of soil hydraulic properties
  - Allocation from the University Funds, since Oct. 2003
- Reduction of soil evaporation in irrigation
  - Allocation from the University Funds, since Oct. 2003
- Effective use of rainfall in irrigation scheduling
  - Allocation from the University Funds, since Apr. 2004
- Assessment of rainfall in arid regions
  - Allocation from the University Funds, since Jun. 2002
- Solute movement in arid soil
  - Allocation from the University Funds, since Jun. 2002
- Digital analyses of salt crust caused by salt accumulation
  - Allocation from the University Funds, since Jun. 2002
- Experiment of surface runoff and seepage water under rainfall
  - Allocation from the University Funds, since Jun. 2004

## **2) Division of Biological Production**

### **Subdivision of Plant Ecophysiology**

- Physiological responses of gramineous plants to drought stress
  - 21<sup>st</sup> Century COE Program Funds from the Ministry of Education, Culture, Sports, Science and Technology, Oct. 2002-Mar. 2007
- Physiological responses of leguminous plants to salt stress
  - 21<sup>st</sup> Century COE Program Funds from the Ministry of Education, Culture, Sports, Science and Technology, Oct. 2002-Mar. 2007
- Photosynthetic characteristics of date palm
  - Allocation from the University Funds, since Apr. 2001
- Control of plant root system
  - Joint Research Funds from Mitsubishi Heavy Industries, Ltd., Sep. 2002 to Mar. 2007
- Identification and characterization of Plant indicators of desertification
  - Core University Program Funds from JSPS, since Apr. 2001
- Relationship between root cell wall and salt tolerance of plants
  - Ministry of Education, Culture, Sports, Science and Technology for Grant in Aid for Scientific Research, Apr. 2005-Mar. 2007.
- Development of Phosphate-Recycle-System using porous glass
  - Founded by Tottori Prefecture, Apr. 2005-Mar. 2007

### **Subdivision of Plant Production**

- Development of process-based ecosystem model by integration of remote sensing, ground observation and modeling studies
  - Japan Society of the Promotion of Science Grants-in-Aid for Scientific Research (A), 2003-2006 (Project Leader: A. Tsunekawa)

Evaluation of effects of habitat fragmentation by man-made structures on endangered Ungulates in Mongolian grasslands

Japan Society of the Promotion of Science Grants-in-Aid for Scientific Research (A), 2006-2009  
(Project Leader: A. Tsunekawa)

The 21st Century COE Program

21<sup>st</sup> Century COE Program Funds from the Ministry of Education, Culture, Sports, Science and Technology, Oct. 2002-Mar. 2007

The Core-University Program, Researches on Combating Desertification and Developmental Utilization in Inland China

Japan Society for the Promotion of Science), 2001-2010 (Program Coordinator in Japan: A. Tsunekawa)

### **3) Division of Afforestation and Land Conservation**

#### **Subdivision of Revegetation and Grassland Development**

Dynamics of Pine trees on sand dunes

Allocation from the University Funds, since Apr. 1994

Tree growth, and nutrient and water dynamics of trees and in the soil

Allocation from the University Funds, since Apr. 1994

Growth and reproductive characteristics of woody plants

Allocation from the University Funds, since Apr. 1995

Ecological studies on sand dune vegetation

Allocation from the University Funds, since Apr. 1995

Maintenance mechanisms of plant communities in arid areas

Allocation from the University Funds, since Apr. 1996

Studies on salt tolerance of woody plants

Allocation from the University Funds, since Apr. 1999

Impacts of climate change on agricultural production in arid areas

Research Institute for Humanity and Nature, since Apr. 2001

Studies on the ecosystem rehabilitation in the loess plateau, China

21<sup>st</sup> Century COE Program Funds from the Ministry of Education, Culture, Sports, Science and Technology, since Oct. 2002

Studies on the water and nutrient dynamics and tree growth

Japan Society of the Promotion of Science Grants-in-Aid for Scientific Research C(2), since Apr. 2004

#### **Subdivision of Land Conservation**

Development of measurement technology on the solute transport in undisturbed soil column and downward flow through the root zone in an irrigated farmland under arid condition

Monbukagakusho Grant-in-Aid for Scientific Research B (2), Apr. 2004-Mar. 2007

Effect of water pollution on clogging of emitters and filters of micro-irrigation system in the Tohoku irrigation project

- Ministry of Agriculture, Forestry and Fisheries, Apr. 2002-Jan. 2007  
Soil conservation and afforestation in wilderness soil of dryland  
Joint Research of Private-sector Funds, Jun. 2005-Mar. 2008  
Effective utilization using DD lime  
Joint Research of Private-sector Funds, Jul. 2005-Mar. 2007  
Development of a simple technology for measuring nitrate nitrogen in soil water of sand dune fields  
Joint Research of Civilian Agency, Apr. 2003-Mar. 2007  
Development of simultaneous measurement of water content, salt concentration and temperature in actual unsaturated soil  
Joint Research of Private-sector Funds, Aug. 2005-Mar. 2007  
Reduction of evaporation from soil surface and temperature environment using various mulching  
Joint Research of Private-sector Funds, Jul. 2006-Mar. 2008  
Scallion cultivation and suitable nitrate supply on sand dune field  
Joint Research of Private-sector Funds, Jul. 2006-Aug. 2007  
Effect of water quality on drip irrigation schedules  
Allocation from the University Funds, since Apr. 2000  
Measurement and numerical simulation of water flow and salt transport in unsaturated soil  
Allocation from the University Funds, since Apr. 2001

#### **4) Division of Comprehensive Measures to Combat Desertification**

- Studies on comprehensive measures to combat desertification  
Allocation from the University Funds, since Oct. 2004  
Studies on local development applying indigenous/traditional knowledge  
Allocation from the University Funds, since Oct. 2004  
Studies on pastoral systems in arid lands  
Allocation from the University Funds, since Oct. 2004  
Basic studies to combat desertification by applying traditional pastoral systems  
Grant-in-Aid for Young Scientists (B), Ministry of Education, Culture, Sports, Science and Technology, since Apr. 2005  
Water management and parasitic weed control for sustainable food production in Sudan  
AA Platform Program (JSPS), Faculty of Agriculture, Kobe University, since Apr. 2005  
Building a new framework of arid land science through cooperating with human and social scientists  
21<sup>st</sup> Century COE Program Funds from the Ministry of Education, Culture, Sports, Science and Technology, since Apr. 2005  
Studies on human livelihood in the Loess Plateau in China  
Japan-China Joint Study on Combating Desertification and Development in Inland China, Core University Program, JSPS, since Apr. 2005  
Anthropological studies on building a global environmental history  
Inter-university research project, National Museum of Ethnology, since Oct. 2005  
Studies on development and indigenous peoples  
Inter-university research project, National Museum of Ethnology, since Oct. 2005  
Studies on muslim livelihood and its change

*Research Projects*

Inter-university research project, Research Institute for Languages and Cultures of Asia and Africa, Tokyo University of Foreign Studies, since Oct. 2005

Religious anthropological studies on conflict and coexistence between white and black peoples in Islamic zones of Africa

Grant-in-Aid for Scientific Research (A), Ministry of Education, Culture, Sports, Science and Technology, Graduate School of Letters, Nagoya University, since Apr. 2006

Studies on subsistence ecosystems among Arab societies: To combat livelihood degradations

Incubation studies, Research Institute for Humanity and Nature, since Jun. 2006

Studies on land use change before and after 'grain for green' project of China

Showa Shell research grant for environmental studies, since Oct. 2006

Practical research for an understanding of the hunger & civil war of Africa on educational fronts in Japan

Research grant program, the Toyota Foundation, since Nov. 2006