

**CoDoCA**   
Council for Sustainable  
Development of Central Asia

**CAS**  
Chinese  
Academy of  
Sciences

**ICIMOD**  
International Centre  
for Integrated Mountain  
Development

**XIEG**  
Xinjiang Institute  
of Ecology and  
Geography



**Strategic Considerations  
on the Development of Central Asia**

*Editors*

**Mahesh Banskota, Archana S. Karki, and Frank W. Croon**

13-18 September 1996  
Urumqi, China

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Institute of

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***Published by***

Council for Sustainable Development of Central Asia  
(CoDoCA)

***Layout by***

Dharma R. Maharjan

***Typesetting at***

ICIMOD Publications' Unit

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# Foreword

It is our great pleasure to present the proceedings of the second CoDoCA conference 'Strategic Considerations on the Development of Central Asia' held in Urumqi, Xinjiang, China from September 13-18, 1998.

It was a large gathering with more than 150 participants from 25 countries, the largest meeting held on this topic in this remote part of Western China. By providing a platform for people from different parts of Central Asia, who not only crossed borders that had remained closed for many decades, but who could also discuss topics of common interest that were considered irrelevant or too sensitive until recent times, the conference in many ways had historic significance.

Central Asia is a region of extreme climatic conditions. Extremes range from those of heat in the Turfan basin (where underground water supply systems built 1,000 years ago are still in use) to those of snow and severe cold experienced around the Tian Shan (Heavenly) Lake.

The challenges of Central Asia are not limited to the climate alone. Fundamental questions include how to transform economies that have been subjected to decades of inefficient central planning? how can incomes be generated by scattered rural populations living on arid and fragile lands? how can we combat desertification and erosion and avoid further environmental disaster? how can water quality be preserved and sanitation be implemented? how to ensure sufficient supplies of water where and when it is needed? and - perhaps most urgently — how to cooperate more smoothly and constructively with fellow Central Asians who share so many natural and cultural resources? All these issues surfaced at the conference and many participants were overwhelmed by the amount and variety of problems that were presented. At the same time, by reflecting on the many different approaches of the presentations and discussing these together over a period of five days, many saw glimpses of possible solutions and some were able to take concrete steps towards sustainable development and nature protection.

It took many years to prepare for this conference. It was conceived four years earlier at the first CoDoCA conference in Mongolia in 1994 by the Chinese delegate from Xinjiang, Dr. Yuan Guo Ying, who prepared the ground for the meeting in Urumqi.

We could not have held the event without the strong support and cooperation of our official co-organizers. I would like to mention in particular Prof. Sun Hong Lie and Madame Fu Shuqin, of the Chinese Academy of Sciences, and Prof. Song Yu Dong and Liu Wenjiang of the Xinjiang Institute of Ecology and Geography.

We are also grateful to Mr. Egbert Pelinck, Director General and Dr. Mahesh Banskota, Deputy Director General of the International Centre for Integrated Mountain Development for their wholehearted support. We received timely assistance from Mr. Mambetov and his staff of the Interstate Council for Kazakhstan, Kyrgyzstan, Tadjikistan, and

Uzbekistan as well as from the Kazakhstan Academy of Sciences. I would also like to thank the donors, especially Ford Foundation, the Dutch Ministry of Spatial Planning and Environment, and the Swiss Agency for Development and Cooperation.

I hope the proceedings convey the spirit of the conference. As said, the topics were diverse, but in their diversity they present an accurate picture of the challenges that Central Asia will face in the years to come.

Sander G. Tideman  
Chairman  
Council for Sustainable Development of Central Asia

# Acknowledgements

The second CoDoCA conference was organized by the CoDoCA board members Mr. Sander Tideman, Mrs. Ellen Rose, and Mr. Frank W. Croon. Mrs Anneriet Meijers was invaluable as office manager and Mr. Paul Ten Hove gave an invaluable assistance with organizing the many papers and preparing the abstracts. The compiling and editing of these proceedings were undertaken by ICIMOD.

The editors gratefully acknowledge the support of many people and institutions to the conference and also to the proceedings.

Dr. Mahesh Banskota	Mrs. Annerie Meijers	Mr. Lambert van der Aalsvoort
Dr. Sun Honglie	Mr. Paul ten Hove	Mrs. Janine Hetterschij
Dr. Song Yudong	Mrs. Marieke Reichwein	Mr. Egbert Pelinck
Dr. Fu Shuqin	Mrs. Nancy Nash	Mr. Dharma R. Maharjan
Dr. Liu Wenjiang	Mrs. Angy Kwok	Ms. Archana S. Karki
Dr. Yuan Guoying	Mrs. Lily Zhou	Mr. Harry Westbroek
Mr. & Mrs. Irena Yunosova	Mr. Graham Clarke	Mrs. L. Schuitenmaker
Mr. Eckhart Wintzen	Dr. Shirin Akiner	Mr. Ts. Batbayar
Dr. Fu Lai Sheng	Mr. Allerd Stikker	Mr. A. Pulatov
Mr. B. Mambetov	Mrs. Hazel Henderson	Mr. Don Bedunah
Mr. Tim Grout Smith	Mr. Cees de Haan	Mr. Igor Severskye
Dr. Hemanta Mishra	Mrs. Carol Kerven	Mr. Branko Bosnjakovics
Mr. Max Haberstroh	Mr. Stephan Domke	Mr. Maximilian Soh
Mr. H. Schulte Nordholt	Mr. Peter Treuner	Mr. Markus Muller

The following institutions are thanked for their moral and financial support.

Royal Netherlands Embassy, Beijing

Interstate Council For Kazakhstan, Kyrghyzstan, Tadzhikstan and Uzbekistan

Triodos Bank, The Netherlands

Shell Solar

The ICIMOD Publications' Unit for preparing the document for publication.

# Abbreviations

<b>ADB</b>	Asian Development Bank
<b>ADF</b>	Asian Development Fund
<b>AKRSP</b>	Aga Khan Rural Support Programme
<b>ASP</b>	Aral Sea Programme
<b>ASP</b>	Aral Sea Programme
<b>ASWRP</b>	Aral Sea Wetland Restoration Project
<b>AusAid/AIDAB</b>	Australian Aid Bureau (International Development)
<b>CAEC</b>	Central Asian Economic Community
<b>CAR</b>	Central Asian Republics
<b>CAS</b>	Chinese Academy of Sciences
<b>CCD</b>	The United Nations Convention to Combat Desertification
<b>CIDA</b>	Canadian International Development Agency
<b>CIS</b>	Confederation of States Formerly in the USSR (post 1990)
<b>COD</b>	Chemical Oxygen Demand
<b>CoDoCA</b>	Council for Sustainable Development of Central Asia
<b>DMC</b>	Developing Member Countries
<b>ECE</b>	Economic Commission for Europe
<b>ESCAP</b>	Economic and Social Commission for Asia and the Pacific
<b>FSU</b>	Disintegration of the Soviet Union
<b>GBM</b>	Ganga Brahamaputra and Meghana
<b>GEF</b>	Global Environment Fund
<b>GIS</b>	Geographic Information Systems
<b>HKH</b>	Hindu Kush-Himalayas
<b>HPI</b>	Heifer Project International
<b>ICAS</b>	Insterstate Council for the Aral Sea
<b>ICAS</b>	Interstate Council on the Aral Sea
<b>ICIMOD</b>	International Centre for Integrated Mountain Development
<b>IMF</b>	International Monetary Fund

<b>MCL</b>	Maximum Contamination Level
<b>MFI</b>	Micro-Finance Institution
<b>MIS</b>	Management Information Systems
<b>NADRI</b>	National Arid Land Development and Research Institute
<b>NEPA</b>	National Environmental Protection Agency
<b>NGO</b>	Non-government Organization
<b>OCR</b>	Ordinary Capital Resources
<b>ODA</b>	Overseas' Development Assistance
<b>OM</b>	Organic Matter
<b>PEACE</b>	Poverty Eradication and Community Empowerment
<b>PRA</b>	Participatory Rural Appraisal
<b>RETA</b>	Regional Technical Assistance
<b>SAVE</b>	Society for Afghanistan Volunteer Environmentalists
<b>SLM</b>	Sustainable Land Management
<b>TA</b>	Technical Assistance
<b>TEAP</b>	TACIS Environmental Awareness Programme
<b>TIEIAM</b>	Tashkent Institute of Irrigation and Agricultural Mechanisation Engineers
<b>TRACECA</b>	Transport Plans for Central Asia
<b>UNCED</b>	United Nations Conference on Environment and Development
<b>UNCHS</b>	United Nations Centre for Human Settlements
<b>UNDP</b>	United Nations Development Programme
<b>UNEP</b>	United Nations Environmental Programme
<b>WAPDA</b>	Water and Power Development Authority (Pakistan)
<b>WARMAP</b>	Water Resources' Management and Agricultural Production in the Central Asian Republics
<b>WB</b>	World Bank
<b>WEFTECH</b>	Water Environment Federation
<b>WFP</b>	World Food Programme
<b>WWF</b>	World Wildlife Fund



# Editorial Note

Paper headings have not received substantive changes. The current document has been produced as a record of a unique process of consultation between representatives of countries, organizations, cultures, disciplines, and language groups and papers are not produced in their entirety.

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# Background

1

## **Central Asia: An Introduction**

The peoples and governments in Central Asia are faced with major challenges as they step into the new millennium. The challenges are to raise the standards of living while safeguarding the region's fragile environment and unique cultural heritage. Most countries have in common a very inhospitable environment and are thinly populated. With an average annual rainfall (in the plains) of less than 400mm, Central Asia belongs to the arid to semi-arid climatic zone.

Central Asia spans a large continental landmass with high mountain ranges and plateaus which form the source of Asia's great rivers. The ecological balance here affects the global ecosystem, yet much of Central Asia's arid and semi-arid landmass has already been seriously degraded and is subject to growing desertification. There is a crucial need to develop policies and technolo-

gies that are well suited to the unique environmental and social conditions of Central Asia. The respective areas and populations of the countries of Central Asia are shown in Table 1.

The political changes that resulted in the establishment of new countries have also caused far-reaching changes in the economy, trade, industry, and standards of living of the people in these countries. There is renewed interest to learn from the experience of others and participate in regional cooperation for the sustainable use of natural resources in the region.

The key question is how to balance economic and social objectives with environmental constraints and opportunities. How to promote development in a truly sustainable manner in environmental, social and economic terms is a common concern for all the countries of the region.

Background

**Table 1: Statistical Information about Some Central Asian States**

Country	Area (1,000sq.km)	Population (Million)	Population Density (People/sq.km)	Urban Population (%)
Kazakhstan	2717	17.1	34	6
Turkmenistan	488	4.1	8	45
Uzbekistan	442	22.8	51	12
Tajikistan	142.5	6.1	43	32
Kyrgyzstan	198.5	4.7	24	39
Mongolia	1565	2.4	2	59
Nepal	140.8	21.4	156	12
Bhutan	47	1.6	34	6
Afghanistan	652	20	31	20

### **Background to CoDoCA**

The first Conference on Sustainable Development of Central Asia (CoDoCA I) was held in Ulaan Baatar, Mongolia, in September 1994. The conference was initiated by the Mongolian Academy of Sciences, and co-organized by the Central Asia Research Forum of the School of Oriental and African Studies of the University of London and Shambhala Foundation. The event was sponsored by the European Union, AusAid/AIDAB, and the UNDP. The conference, which was opened by the Mongolian President, P. Ochirbat, was attended by 120 people from many different countries.

In order to continue the debate started in Mongolia, the conference delegates agreed on the establishment of the Council for Sustainable Development of Central Asia (CoDoCA). CoDoCA was registered as a foundation in the Netherlands in 1995. CoDoCA's secretariat is based in the Netherlands but it is expected that it will be relocated to one of the countries in Central Asia.

The Council is a vehicle for the development of a network of organizations and individuals involved or interested in Central Asia. Although the region is defined in wide geographical terms, and spans many different countries and na-

tions, there are many common development problems and opportunities that provide a strong basis for regional exchange and cooperation among the many communities of Central Asia.

### **Objectives and Scope of the Second CoDoCA Conference**

The Second Conference on Sustainable Development of Central Asia (CoDoCA II) took place in Urumqi, China, from September 13-18, 1998.

The Conference was a joint initiative of the Council for Sustainable Development of Central Asia (CoDoCA) and the Xinjiang Environmental Science Research Institute. The conference was organized in association with the Chinese Academy of Sciences (CAS), the International Centre for Integrated Mountain Development (ICIMOD), and the Xinjiang Institute of Ecology and Geography.

Urumqi was an excellent venue for such a meeting. As the capital of the most westerly province of China, Xinjiang occupies a strategic location for both old and new trade routes, serving as a bridge between China and new republics of Central Asia, between the Middle East, Europe, and the Asia-Pacific region.

The conference received major financial support from the Ford Foundation, the Kingdom of the Netherlands (VROM) and the Swiss Agency for Development and Cooperation (SDC). Additional funding came from Soros Foundation, Asia Pacific Mountain Network, Shell Solar, and Triodos Bank.

As stated, the conference in Urumqi continued the debate started in 1994 by the first Conference on Sustainable Development of Central Asia (CoDoCA I) in Ulaan Baatar, Mongolia, at which a wide range of important issues affecting the ecology and economy of the region was discussed by experts from Central Asia and other countries from Western Europe and North America. The meeting was a breakthrough, because it marked the first step towards regional cooperation in the largely arid and landlocked landmass of the Euro-Asian continent with its typical geographical and environmental features.

The delegates recognised the need to seek special solutions for the development problems of Central Asia. Sharing common historic roots in great nomadic civilisations, the Central Asian nations could learn from one another in preparing for the challenges presented by the modern global economy whilst maintaining the integrity of their indigenous cultures and environment.

The CoDoCA II conference in Urumqi focussed on key issues affecting Central Asia, in particular the relationship between economic and social development and the protection of Central Asia's fragile resources. The central theme of the conference — the limited carrying capacity of Central Asia's arid plains and mountains — is at the heart of the region's common environmental and development problems. Solutions to these problems should take these geographic conditions into account. It is only on this basis that Central Asian nations can strengthen their local economies in an

age of increasing economic interdependence and vulnerability.

The conference addressed specialised topics such as sustainable land use, erosion control, protection of water resources, and pastoral economics. There were a number of 'technical' presentations on energy, biomass and wildlife management, and environmental problems. There were examples of appropriate technologies, community-managed irrigation, renewable energy systems, and innovative mechanisms for financing resource conservation and other local-level sustainable development initiatives.

The conference began on the morning of 13 September with an Inaugural Session which was attended by high-ranking government officials and senior academicians of the host country, along with distinguished participants from 22 countries. The gathering was addressed by representatives from different countries; these included representatives from the host country, the organizers, the co-organizers and the donors (see Chapter One).

*Day one* focussed on presentations dealing with Central Asia's unique natural resources and land degradation; these included pressures on the use and preservation of water, pastures, and wildlife and species' preservation. *Day two* focussed on Sustainable Development in Central Asia with presentations on economic planning perspectives, institutional and social perspectives, and the role of traditional and local communities. *Day three* focussed on the implementation aspect and discussed the role of state and other organizations; this included participatory and community-based initiatives, financing sustainable development initiatives, and the management of renewable energy programmes. The final day ended with the adoption of the Urumqi Declaration and the Altai Declaration.

The conference brought together organizations and individuals with interest in the sustainable development of the region. The audiences included policy-makers from different government organizations and researchers and representatives from non-governmental organizations that were committed to building an economically prosperous, socially harmonious, and environmentally secure Central Asia.

The conference provided a valuable and unique opportunity for Central Asians to meet colleagues from neighbouring countries whose borders, until recently, had been closed for decades. The conference also enabled Central Asians to meet with participants from other parts of the world that had a wide range of disciplinary and technical expertise relevant to their region.

### **Organization of this Report**

Beginning with a chapter on the Inaugural Session, this report is structured along the main themes of the conference. In order to retain consistency in the topics some presentations have been re-grouped and therefore do not necessarily follow the presentation sequence of the conference.

The participants from Central Asia made a strong commitment to work together to promote sustainable development in the region through a careful balancing of environmental and development activities at the local, national, regional, and international levels. This is reflected in the main outputs of the Conference which are the **'Urumqi Declaration'** and the **'Altai Declaration'** (see Chapter nine for details).

## Opening Ceremony

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**The Opening Ceremony took place on the morning of 14 September and was attended by a number of representatives from the host country's government as well as from the neighbouring countries. Apart from the distinguished scholars and development practitioners who were participating, there was also a large number of special invitees attending the Opening Session. Journalists, representing Chinese media, were also present. The speeches delivered, and in some instances translated into English, are presented in this chapter.**

**SANDER G. TIDEMAN**  
**Chairman, Council for the Sustainable Development of Central Asia (CoDoCA)**

It is a great pleasure to see so many distinguished delegates from so many different countries and professional backgrounds at this conference. We are particularly pleased that so many high-level government representatives and policy-makers have taken the trouble to travel to Urumqi, in spite of obstacles such as long distances, complicated visa procedures, floods, and the financial crises in Asia and Russia.

I would particularly like to welcome:

- ▶ Madam Liu Xiuru, Director General, State Environmental Protection Agency of China
- ▶ Wang Huai Yu, Vice-chairman of the Xinjiang Government Region
- ▶ Mr. Kyshtybaev, Vice-minister of the Environment of Kyrgyzstan
- ▶ Mr. Bulat Esekin, Director, National Environmental Action Plan of Kazakhstan
- ▶ Mr. Bedyurov, National Representative of the Altai Republic of Russia
- ▶ Mr. Togtokh, Member of Parliament of Mongolia, the country in which CoDoCA was founded.

Opening Ceremony



This impressive show indicates that many people in Central Asia share the vision of CoDoCA; that is, to create a platform through which all nations and peoples of this unique region can discuss their common environmental and developmental problems and to develop a suitable development model based on the special natural, ecological, and social conditions of this huge and largely unspoiled landmass. The failure to take these conditions into account can lead to enormous environmental and social damage, as was clearly shown by the Aral Sea disaster.

A suitable development model for this region is also needed, since one cannot simply expect that opening up to foreign markets and capital will automatically and by itself bring prosperity to all. In fact, opening up to today's global economy is not without its price in social and environmental terms. This has become very clear from the recent collapse of the Asian Tiger and Russian financial markets.

Since Central Asia includes much of Western China, especially the Xinjiang region and the Tibetan-Qinghai plateau, it is very significant that Urumqi is the host of this conference. We are very happy indeed that our Chinese friends have taken the initiative to host the second CoDoCA conference after the Mongolians hosted the first conference.

We hope that it will lead to more intense cooperation among the Central Asian nations which share crucial environmental assets, particularly the mountain ranges of the Tianshan, Altai, Pamir, Hindu-Kush, and Himalaya. These mountains hold the water resources that form the source of life in Central Asia and also for much of Asia and Eurasia. Most big Asian

rivers spring from Central Asia; viz., the Yellow River, the Yangtse River, the Mekong, the Sutlej, the Ganges, the Brahmaputra, and the Indus. If the natural resources in the highlands are badly treated, such as the forests, the effects on the lowlands are clear, as is evident from the recent floods in China.

CoDoCA believes that the people of Central Asia should see themselves as the custodians of these unique and special resources which are so important for the rest of the world. Significantly, the traditional inhabitants of this region were very well aware of how to deal with these fragile and often finite resources. Nomads would move their flocks with the seasons to prevent pastures from being overgrazed. Modern development planners should therefore learn from the traditional cultures how to maintain the ecological balance of the soil and wildlife.

CoDoCA started four years ago at a similar conference in Mongolia; the proceedings of which have been published as a book. Yet CoDoCA is only a small non-governmental network of people interested in the development of Central Asia. We cannot and would not want to impose any development view on any nation. It is up to each nation and nationality to determine its own future.

We can merely create a platform for debate about which kind of development brings the most benefits in the long term, namely, harmony among people and nature. It is my sincere hope that this unique conference will be a catalyst in this regard. I wish you a very fruitful conference.

Thankyou very much.

**PROFESSOR SONG YUDONG**  
**Director, Xinjiang Institute of**  
**Ecology and Geography, Chinese**  
**Academy of Sciences (CAS)**

Honourable Mr. Chairman, Respected friends from all parts of the world, Ladies and Gentlemen,

In the charming golden season of autumn, the Second Conference on Sustainable Development of Central Asia is due to open solemnly in the beautiful city of Urumqi. On this occasion, please allow me, as falls to the honour of the organizers, to extend a warm welcome to foreign guests from afar and express our heartfelt thanks to the government leaders, heads of relevant departments, and scholars who are present here.

We feel it a great honour to have the Second Conference on Sustainable Development of Central Asia held in Xinjiang. The issues to be discussed at the conference will create an important and far-reaching influence on the sustainable development of Xinjiang's society and economy and help to realise Chinese President Jiang Zeming's call to "Create a new northwestern region with beautiful mountains and rivers". So, I would like to take this opportunity to express my deepest thanks to the CoDoCA.

Historically, the famous Silk Road once linked Xinjiang closely with the Central Asian countries and the rest of the world. Today, the new Euro-Asian Continental Bridge enables Xinjiang to open further to the outside world. I am sure the profound and historical friendship between Xinjiang, China, and Central Asia, as well as the rest of world, will be reinforced in the implementation of a sustainable development programme for Central Asia.

Finally, I hope the conference will achieve satisfactory results and I wish

all the delegates deputed from all over the world an enjoyable stay in Xinjiang!

Thankyou!

**PROFESSOR WANG HUAI YU**  
**Vice-Chairman of the People's**  
**Government of Xinjiang Uygur**  
**Autonomous Region, China**

Chairman, Fellow Deputies, Ladies and Gentlemen,

Today, the Second CoDoCA Conference on 'Strategic Considerations for Development of Central Asia' is beginning. We are honoured that the conference is being held here in Urumqi, the geographic centre of Asia. On behalf of the government of Xinjiang Uygur Autonomous Region and all nationalities in Xinjiang, I cordially welcome all the guests from government departments, international organizations, and academic institutes, as well as social workers, specialists, and scholars. I wish the conference great success and hope it can make an important contribution to the process of sustainable development in Central Asia.

Since the UN Congress on Environment and Development held in Brazil in 1992, sustainable development has become an important global concern for the survival and development of human society. Close attention is being given to promotion of sustainable development through the adoption of various actions by countries around the world. This International Conference on Sustainable Development of Central Asia sponsored by the Council for Sustainable Development of Central Asia (CoDoCA) is also a positive step in this direction.

Central Asia has made an important contribution to the long history of the development of human civilisation. The common environmental problems of the

Region have made the development of the society and the economy more difficult than in other regions around the world. The promotion of rapid and efficient development, both social and economic, with the limited environmental carrying capacity and protection of existing natural resources, requires long-term commitment to a programme of sustainable development of Central Asia. The topics of this conference are therefore highly relevant and appropriate to the realities of Central Asia and can have a significant effect on the development of society and economy in Central Asia.

China has prepared a '21st Century Agenda' (Agenda 21) which highlights its national policy and action for sustainable development. This has seen positive results since it was started some years ago. In the light of the severely deteriorated eco-environment in Northwest China, President Jiang Zeming put forward the slogan "*afforestation, greening the desert, and setting up eco-agriculture*" to improve the environment and called upon the people in Northwest China to make a long-term effort to rebuild a beautiful Northwest China. All this indicates the commitment to sustainable development in Northwest China.

As the largest province in China, the Xinjiang region is rich in land, light, heat, and mineral resources. However, because of its geographic location, Xinjiang has suffered from extensive desertification, and this has seriously restricted its socioeconomic development. Since the establishment of the People's Republic of China, Xinjiang, with the support of the Central Government, has made significant strides in constructing an oasis in the desert. The state has placed great hope on the future development of Xinjiang. The province will spare no effort to reduce development differences between Xinjiang and the inland areas in order to promote sustainable development in the region.

We are hoping to cooperate with CoDoCA to draw attention and support from the international community for our efforts. During the conference, we hope to learn about many successful experiences of sustainable development from other countries, especially from our neighbours — the countries in Central Asia. Although West European countries are very far away from Xinjiang, we appreciate their interest and the support they have given to sustainable development in Central Asia. I believe our common goal is "Only one earth for us", and if the countries and regions of Central Asia, work together the prospects for the Central Asian development are very bright.

As the host, I welcome all friends who have come to Xinjiang and hope you can go around the city. Let the world understand Xinjiang, let Xinjiang understand the world.

Finally, let us wish the conference complete success and good health to all friends.

**LIU XIU-RU**

***Director of the Nature and Ecological Protection Department,  
China National Bureau for Environmental Protection, China***

Mr. Chairman, All the Deputies,  
Ladies and Gentlemen,

Today, the Second International Conference for the Sustainable Development of Central Asia is being held in Urumqi, the beautiful heartland of Asia. On behalf of Mr. Xie Zhenhua, Director of the China State Bureau of Environmental Protection, and myself, I warmly congratulate you on the opening of the conference. It is four years now since the First International Conference for the Sustainable Development of Central Asia was held in Ulaan Baatar, Mongo-

lia. In the course of four years, a tremendous change has taken place in the political and economic systems and even in environmental protection. The Second International Conference for the Sustainable Development of Central Asia, being held at the turn of the century, will be an important conference.

Central Asia has special geographical and environmental conditions and most of the Central Asian countries are in either arid or semi-arid regions. Their unique environmental conditions necessitate a greater sensitivity to problems of sustainable water use, land degradation, and wildlife and species' protection which affect not only the local ecobalance but also the global ecosystem. The environment and sustainable development of the Central Asian region are our common concern. It is essential to bring Chinese and foreign experts and scholars together to discuss and study the environment and development in this region. We hope this conference will achieve a breakthrough and obtain positive results in this respect.

Environmental protection has been given great importance by both the Chinese Communist Party and the government. Persistent efforts from all relevant departments, and vigorous support and active participation from the society, have helped us to make a lot of progress in this field. Taking precautions against pollution, finding efficient ways to reinforce ecological protection, exploring efficient ways for rural sustainable development, and promoting new economic activities in the countryside in an integrated manner are among the important efforts made so far. The China State Bureau of Environmental Protection will strengthen environmental management in the process of development and use of natural resources, prevent damage to new ecosystems, promote national natural reserves, safeguard biodiversity, strengthen environmental management over township enterprises, and maintain

strict control over the pollution of land resources in order to create a good ecological environment for the sustainable development of the country's economy and society: these are all the ultimate goals of development in agriculture and the rural economy.

However, it should be noted that our current environmental situation is still fairly grave. The floods created by the Yangtze, Neng and the Song Hua Jiang rivers may be the results of climate change, but they are exacerbated by the ecological destruction in the whole valley. This should provide us with a good lesson. At present, the country is experiencing a radical transformation in thinking about a new process of economic growth. However, the emphasis is on sustainable development so that socio-economic development is based on the carrying capacity of the environment and rational use of natural resources. The State Bureau of Environmental Protection will adapt policies and implement them in various conditions and areas for nation-wide ecological protection. A concerted effort will be made to control industrial pollution in the eastern part of the country, while, in the western part, emphasis will be on ecological protection. In extremely fragile ecological regions, special protection areas must be set up to safeguard the fragile ecology environments. As for development in resource-concentrated areas, management and regulation will be reinforced with relevant rules governing the development and use of natural resources and preventing the destruction of the environment. In regions with a better ecosystem and natural resources, eco-model areas are to be set up in an effort to promote eco-protection.

Environmental protection is borderless and this planet is our common home. Let us join our hands to safeguard our common homestead. China has always played an important and positive role in world affairs. Towards global environ-

mental protection, our attitude is both consistent and positive. China's State Bureau of Environmental Protection is willing to undertake the efforts needed, play its part, and make a valuable contribution to advance cooperation in Central Asia and facilitate the realisation of sustainable development in the Central Asian region.

Finally, I wish the Conference every success.

**MR. KYSHTYBAEV**  
**Deputy Minister for the Environment, Kyrgyzstan**

I would like to thank the organizers CoDoCA and their Chinese counterparts for such a nice opportunity to participate in this conference. Kyrgyzstan's environment, being a highland environment, is quite vulnerable to technological and anthropogenic influences. This was stressed at the Rio Declaration also. Therefore, finding a solution to the environmental problems of Kyrgyzstan is of paramount importance to the country. At the same time the environmental problems faced by Kyrgyzstan are similar to those faced by other countries. Environmental issues are not faced by a single country alone but by all or most neighbouring countries. Currently, there is inadequate financing from the state budget to tackle environmental problems. Therefore it is necessary to attract foreign or international resources to resolve environmental issues faced by the CIS countries. We can say that this is a transitional and post-transitional period in the case of environmental protection. The problem is very pressing, and it should be tackled today. I hope that the discussions and considerations in the following days will bring concrete results.

In Kyrgyzstan, we have adopted an action plan on protection of the environment and an action plan on the hygiene of the environment. We have also

adopted a concept of environmental safety. Besides these, one of the main components in our President's sustainable development and human development programme is the component on environmental protection. All these four papers form a basis to implement the policy on environmental protection. I believe that this conference should be used for the adoption of positions that later can help all of us to strengthen environmental protection in our countries, especially as there is a large number of NGOs and INGOs present here. Also, I want to emphasise that the conference of the European Ministers of Environmental Protection in Denmark, in June 1998, stressed the need to give support to newly independent states in order to resolve their environmental issues and problems. I do believe that our interactions here will yield good fruit.

**MR. BULAT ESEKIN**  
**Director, National Environment Centre, Kazakhstan**

Dear Ladies and Gentlemen,

I should say that environmental problems in the past ten years have increased. Kazakhstan is rich in natural resources but, at the same time, suffers from non-sustainable development. Nowadays it is a matter of common knowledge that the main problems faced by Kazakhstan are the Aral Sea disaster and the nuclear test areas.

In Kazakhstan the potable water consumption rate is the lowest on the continent. Fifty per cent of the water comes from neighbouring countries. Sixty per cent of the territory of Kazakhstan is vulnerable to desertification. Kazakhstan suffers from the highest industrial pollution rate. It has the largest polluting power stations, most coal mines, and most numerous chemical operations in the region. All these problems need immediate action. Kazakhstan today has a

long-term development strategy that pays a lot of attention to regional cooperation. To tackle its problems, five Presidents in the region have adopted concrete joint projects. The President of the region declared this year as the 'Year for the Protection of Nature'. We are now developing programmes on regional cooperation for environmental protection.

Let me wish every success to the deliberations of this conference. I believe it is high time for CoDoCA to move into more practical action, so that it can become part of the national programmes.

Thankyou.

**MR. BEDHYUROV**  
**National Representative, Altai**  
**Republic, Russia**

Dear Ladies and Gentlemen,

It is my pleasure to greet you here at this conference in this city of Urumqi, in Western China. "*Water will be more expensive than gold*" – my people lived for years by this slogan. This is true because, on the threshold of the third millennium, humanity is facing serious environmental problems. There are territories in Central Asia that are quite interesting for all the world's nations. I am grateful to CoDoCA for organizing such a conference so that we can meet representatives from different Central Asian countries. Some years ago, when we visited the neighbouring country of Mongolia, I proposed an idea for cultural and economic cooperation among the countries of Central Asia. At that time we did not know anything about the proposition for such a conference in Urumqi. I am very happy to learn that such a conference is taking place for the second time. China borders the Altai region, which is part of Russia. Altai is a big republic and it spreads from north to south

from the Tiger forests of Russia to the Gobi desert. From west to east it spreads from the River Yirtish to Lake Baikal. The Altai area is at the heart of Russia and the heart of Altai is the Republic of Altai. Altai alone borders the four states of Mongolia, Russia, China, and Kazakhstan. Altai is the place where four other borders also come together: they are the religious and cultural borders of Islam, Confucianism, Christianity, and Buddhism. That is the reason why the Altai people are tolerant to different languages, cultures, and religions. The Altai people value the life of anything from an ant to a plant or a human being.

We are not facing many industrial deadlocks. When I refer to geopolitical and spiritual boundaries in Altai I want to say that all these countries in the region need to know how to grow into the future. I want to tell you that even though Altai is suffering from the processes of reform, the people of Altai still possess an almost untouched nature. The same can be said for west Mongolia and west China, we are all regions of the future because we believe that our poverty is our potential and our advantage because we are happy about the fact that we are waiting for industrial development to take place. I do believe that during our discussions here we will find ways for achieving better development. That is the reason why I believe that it is vital to adopt, at this conference, the Altai Convention. We are ready to share with you our strategic wealth, and that is pure drinking water. The Republic of Altai comes second in the CIS league of drinking water resources after Lake Baikal. We still possess vast forests that are considered to be the second largest in the world after the Amazonian forests. I believe that very soon it is going to be equally important to construct water pipelines as it is currently to build gas and oil pipelines.

We are grateful to the organizers for giving us the opportunity to participate in

this conference. Because we want to pave the way for the future. It was with great pleasure that we accepted the invitation to participate. Unfortunately, the Head of our Republic could not attend the conference owing to pressing economic and social problems now being faced by the republic. However, it is under his instructions that we are attending this conference.

Let me greet all of you here on behalf of the Altai people, the Altai Government, and the Altai delegation. I would also like to greet the people of Xinjiang on behalf of the Congress of Turkish Nations, of which I am the President. I would also like to greet my colleagues and scholars as members of the three Academies in Russia. Lastly, I wish to greet you as a writer and Secretary of the Board of the Union of Writers in Russia. I hope that we will be inspired by the vast territories of mountains, steppes, and deserts. I wish everybody success in our joint work here.

**MR. TOGTOKH**  
**Member of Parliament, Mongolia,**  
**Chief Environment Committee**

I am very happy to attend this Second CoDoCA Conference that is taking place in Urumqi — the beautiful capital of Xinjiang. I very clearly remember that, just four years ago, in September 1994, we took the initiative to host the First CoDoCA Conference in Ulan Baatar. The President of Mongolia came to the opening ceremony and extended a warm welcome to all the participants. All countries of Central Asia share a common fragile environment and also their development needs. On behalf of the Mongolian delegation and as a Member of Parliament, I would like to extend our sincere greetings to the host Government, the host institution, and CoDoCA. Lastly, I wish the conference a grand success.

**DR. MAHESH BANSKOTA**  
**Deputy Director General,**  
**ICIMOD**

*Kathmandu, Nepal*

Mr. Chairman and Distinguished Participants,

On behalf of CoDoCA, Xinjiang Institute of Ecology and Geography, and the International Centre for Integrated Mountain Development (ICIMOD), I would also like to extend a warm welcome to all of you. This conference on 'Strategic Considerations on the Development of Central Asia' being held here in Urumqi has attracted and brought together a wide range of policy-makers, experts, and practitioners. Let us hope our collective wisdom will contribute to balanced development of the people and the environment of this critical but fragile landscape of Central Asia.

ICIMOD is located in the mountainous Kingdom of Nepal. It is working for the sustainable development of the Hindu Kush-Himalayas, the vast mountain chain that separates Central Asia and South Asia. The main objective of ICIMOD is to help promote economically and environmentally sound mountain development and to improve the well-being of mountain people. The centre works as an interdisciplinary research, training, and information exchange organization. It also provides advisory services and many opportunities for regional cooperation in the region.

Rapid economic and environmental change is occurring in all parts of the globe. This is true for isolated and inaccessible areas such as the Hindu Kush-Himalayas (HKH) and Central Asia. There is a great hurry for economic development in the HKH region and Central Asia; and this is where the central questions are. How do we achieve sustainable development? What are the trade-offs we want to make and who should bear these costs? What do we

wish to keep and what do we want to relinquish? Choices need to be made in all aspects of life.

In the past such decisions were made by the people — both in Central Asia and the Hindu Kush-Himalayas, based on very limited information — most of which came from their own experiences. Today the reservoir of information has greatly expanded. We can see from the gathering here today that mountain areas and Central Asia are also on the information highway. The Internet has already opened the old silk route. Hopefully, this vastly increased supply of information will help people make better choices that will lead to sustainable standards of living and safer environments.

I believe the purpose of this conference is to share, exchange, and interact about our experiences in what works and what are the lessons from our mistakes. Change is inevitable, no matter where we are. The challenge for all of us, whether in the mountains of the Hindu Kush-Himalayas or in other parts of Central Asia, is to manage change on a sustainable basis.

I wish you a most productive meeting. I look forward to interactions in the days ahead.

Thankyou.

**MADAM FU SHUQIN**  
**Chinese Academy of Sciences**

*China*

Mr. Chairman, Dear Friends, Ladies and Gentlemen,

It is my pleasure and honour, on behalf of the Bureau of International Cooperation, Chinese Academy of Sciences (CAS), to extend our congratulations on the opening of the Second Conference on Sustainable Development of Central

Asia in the City of Urumqi, as well as to extend a warm welcome to all the participants who have come to attend the Conference. I would also like to avail myself of this opportunity to thank the Council for Sustainable Development of Central Asia (CoDoCA), the International Centre for Integrated Mountain Development (ICIMOD), and Xinjiang Institute of Ecology and Geography, CAS, for their great efforts in planning and organizing the conference. I would also like to thank all others who have helped in the preparation of this conference.

As most of you are aware, Central Asia has not only been very important historically, but is also seen as a very fragile environment. Global warming and changes in the global economy are also making their impact in the area. Although the region is rich in natural resources, the fragility of the environment must be taken into consideration seriously. The people of this area are also making a great effort to improve their living conditions. In all these areas, we in China not only hope to learn from the experiences of others, but would also like to share our own experiences. We live on a small planet where all are linked together economically and ecologically. One of the basic components of sustainable development that aims at economic prosperity, environmental balance, and social harmony is to be able to cooperate and work together for our common good.

Ladies and gentlemen, this conference, organized by the CoDoCA in collaboration with ICIMOD and the Chinese Academy of Sciences, will provide a good opportunity for experts and scholars from China and abroad to exchange experiences and research achievements in the sustainable development and management of the environment in Central Asia. I also hope that the opportunity provided by the conference, to share China's knowledge on sustainable development and management of the en-



vironment with our friends from abroad, will be useful.

Finally, I wish all the participants to this conference a pleasant stay in Urumqi as well as wishing the conference great success.

Thankyou very much.

**MR B. BOSNJAKOVIC**  
**Representative of the Netherlands**  
**Government**

Mr. Chairman, distinguished Delegates, Ladies and Gentlemen,

I am speaking on behalf of the Dutch Ministry of Housing, Spatial Planning, and the Environment. I have been asked to do so in my present position as Regional Advisor on the Environment for the UN Economic Commission for Europe.

Sustainable development is a basic pillar of the Dutch national policy. This means the integration of environmental, economic, and social sectors and concerns. One prerequisite is the involvement of all stakeholders (governments, NGOs, enterprises, the business community, and the public).

Assisting sustainable development at the regional level is an important component of the Dutch environmental and development cooperation policy. The numerous Central Asian states present at this conference are all members either of the Economic Commission for Europe (ECE) or of the Economic and Social Commission for Asia and the Pacific (ESCAP), or both. The Netherlands is committed to and involved in the activities of both ECE and ESCAP. The former Dutch Minister of Housing, Spatial Planning, and the Environment, Mrs Margaretha de Boer, recently made the following statement about the CoDoCA Conference.

*“This conference could give a very useful contribution to a realistic vision on sustainable development and environmental management in this important region. For this reason I have decided to support the organization of this event.”*

The pioneering role in the field of sustainable development of the present Dutch Minister of Housing, Spatial Planning, and the Environment, Mr. Jan Pronk, makes me confident that this policy will continue.

On behalf of the Dutch authorities, I wish to thank the host organizers and authorities for their constructive cooperation in the organization of this conference. I wish all participants a fruitful and successful conference.

**DR. STEPHAN HUSY**  
**Representative of the Swiss**  
**Government**

Mr. Chairman, Excellencies, Ladies and Gentlemen,

It is a great pleasure for the Swiss Government, in particular the Swiss Agency for Development and Cooperation that I am representing, to take part in the present conference.

When Mr. Tideman asked SDC one year ago to support this event, we agreed without hesitating. The problems tackled in this forum are in fact crucial.

Today, the issues of maintaining peace and security, of improving the social and economic situation, and of combatting environmental degradation that could endanger the great potential of this region are not only the concern of the Central Asian states but of the whole world.

Switzerland has joined with other international undertakings to support Central Asia. It focusses its cooperation on three objectives:

- ▶ **first**, alleviating poverty in several developing countries of the region,
- ▶ **second**, strengthening political and economic reforms in the countries of the former Soviet Union in transition, and
- ▶ **third**, humanitarian assistance in cases of conflict and natural disaster.

In addition, four countries, Kyrgyzstan, Turkmenistan, Tadjikistan, and Uzbekistan, belong to our voting group within the Bretton Woods' Institutions (WB and IMF). As leader of this group, Switzerland defends the members' interests in these fora.

Last but not least, Switzerland is a mountainous country and as such feels deeply connected to Central Asia. We know

very well from our own experiences the importance of the sustainable development of mountainous regions. Therefore Switzerland became one of the first promoters of the 'Sustainable Mountain Development' initiative during the Rio Conference and its follow-up.

We welcome the efforts undertaken in this conference to promote a concrete interdisciplinary approach and applaud the will to create a forum supporting local and regional initiatives. I hope, and I am confident, that the ambitious objectives of the conference can be met and that this gathering will be a milestone on the way to an intensified transboundary, regional and international cooperation.

Thankyou for your attention.



# Water: A Vital Resource

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## **Introduction**

Water is one of the most important natural resources in Central Asia and critical to the development of virtually every sector of the economy. Its availability is a *sine qua non* for the life of humans, animals, and plants. In spite of its being the most fundamental input, its value has historically been taken for granted, resulting in production practices that were both wasteful and polluting.

In Central Asia there is a unique role for the mountains, as they are the source of all water in the region. However, as a result of intensive deforestation in most Central Asian areas, and ill-conceived hydropower schemes, water resources were seriously damaged and limited.

The remaining water in the basins was also used carelessly. At least in the Amu-Darya and Syr-Darya river basins, the water is mostly (about 85%) used for irrigation and only a small amount is

used for consumption by humans and animals. The use of water for irrigation has not been very efficient and a lot of water has been wasted through evaporation into the air, or seepage into the soil beyond the reach of crop roots.

As rivers are natural drainage systems, part of the groundwater returned to rivers, reservoirs, and depressions. This water, however, was badly contaminated by various types of agro-chemicals, because the main crop, cotton, required numerous applications of pesticide. This was one of the main reasons for the deteriorating hydro-ecological conditions in the region and occurred to such an extent that it had a negative impact on human health. This has led to the well-known Aral Sea crisis.

If proper water treatment plants are available, industrial waste water and sewage can be re-used to irrigate crops and recharge ground- and surface water. Unfortunately, in Central Asia the funds are

generally lacking for building such expensive plants.

That people are sometimes careless about pollution is illustrated by a report in Central Asian newspapers on 3 June, 1998, that one woman died and a hundred people were hospitalised after drinking water from the Issyk-Kul Lake in Kyrgyzstan. The water contained cyanide; the result of an accident on the borders of the lake involving a truck transporting 20 tonnes of this poison.

The discharge from the main river, the Amu-Darya, varies considerably. First of all the discharge has fluctuated greatly over the years. In an average year, such as 1987, the discharge varied between almost zero in winter to almost 1,500m<sup>3</sup>/sec. during the flooding season in July and August. In a wet year this discharge may be as much as 2,000m<sup>3</sup>/sec., but in a dry year no water reaches the basin of the Aral Sea at all.

Moreover, the discharge from the Amu-Darya has constantly decreased since 1960, perhaps due to the above-mentioned deforestation. This aspect, together with the inefficient water use in the extensive developments in irrigation following that year, caused the water level of the Aral Sea to fall about 17m. Thus the Sea was reduced to about half of its original size, while the shore line retracted by tens of kilometres.

It is clear that the reduction of the water level and pollution of the water, have had a negative impact on the aquatic life in the sea. The total average annual catches of fish dropped from 7,500 MT in 1970 to 3,200 MT in 1980, while more recently they have varied between less than 1,500 to 4,500 tonnes annually.

Water is also the source of a clean and rather cheap source of energy. In those locations where there is sufficient discharge from the river and a consider-

able drop in water level, hydropower stations can be built to generate electricity.

The southern part of the Issyk-Kul area in Kyrgyzstan, for instance, is rich in small rivers that are suitable for this purpose. Since these rivers originate from glaciers, their discharges are spread over the year.

In the basin of the Aral Sea, use of water for irrigation is gradually becoming more efficient, because of diversification of crop cultivation away from cotton and also because alternative irrigation methods have been introduced. Of necessity, since pesticides are too expensive (if available at all) and because of environmental awareness, the use of agrochemicals has decreased considerably.

One of the projects implemented in the basin of the Aral Sea is the Aral Sea Wetland Restoration Project (ASWRP), funded by the Dutch government through a trust fund administered by the World Bank, as part of the Aral Sea Programme (ASP) managed by the Interstate Council on the Aral Sea (ICAS). If the recommendations of the study are implemented, they will help to stabilise the hydrological situation, control the desertification process, and restore the functions of the Aral Sea and associated wetlands. Now the UNDP is in the process of reviving the Sustainable Development Commission for the Aral Sea.

In India, a biological process has been developed for the treatment of waste water and sewage. This process is based on the use of lemna, duckweed, and other aquatic plants. The system is very economical, since the energy requirements are only a fraction of those needed for aeration in mechanised systems.

The treatment of highly polluted industrial waste water is increasingly carried out by filtration or osmosis through membranes in combination with disinfection.

## **Critical Areas**

### **Basin Planning**

As water is really a scarce resource in this area, all infrastructural plans have to be aimed at optimal use of available water through improved water management. Development which leads to exhaustion of resources cannot be sustainable in the long term.

In order to guarantee the sustainable use of water resources, development plans should be founded on generally accepted water basin planning. It is most likely that the basic inventory and scientific background information for water basin planning is already available in many scientific institutes in Central Asia.

### **Salinity Control**

Salinity and salinisation caused by overuse of irrigation water and lack of adequate drainage need to be emphasised. This subject, which is one of the threats to the environment and which has been studied in many Central Asian countries, requires attention.

### **Water Conservation**

Water conservation measures should be promoted.

It would be worthwhile to explore the application of new water-saving irrigation techniques (drip irrigation, etc) based upon the experiences in Israel and California. However, special local conditions, such as the hazards of salinisation, should be taken into account. The capital investment required for these systems may turn out to be very high.

### **Reallocation of Water**

In those areas where water is not used effectively, a mechanism could be de-

veloped for reallocation of water to more lucrative applications. This brings up the issue of the value of water and the introduction of pricing on the basis of either cubic metres or irrigated surface. Thus a 'water market' can be created and 'water banking' practices can be developed.

## **Major Issues and Experiences**

### **THE DESERT OASIS ECOLOGICAL AGRICULTURAL PATTERN OF XINJIANG**

***Prof. Zhang Xin Shi***

*China*

This paper is not about a system driven by water. It focusses on the principles of ecological agriculture on arid lands in North-West China, especially with regard to the water problems in agriculture in the area. The principles for ecological agriculture in North-West China include water balance, biodiversity for agricultural ecosystems, the landscape pattern, and conservation and sustainable development. In the water balance principle, the moisture index formula is the soundest one used. This index is also used by the UNDP for its desertification projects and is internationally renowned.

The arid areas in China can be divided into four zones: extreme arid, arid, semi-arid, and dry sub-humid. Arid areas will be between 0.05 and 0.65 - that is the moisture index range within the area. I would like to focus on two aspects of biodiversity in eco-agriculture. The first emphasis is on greater diversity of production, especially for oasis agriculture on arid land, especially in Xinjiang. The integration of different kinds of crops, grain, cash crops, forests, orchids, animal husbandry, different lands, fish farms, and processing industries is good for oasis agriculture. The second emphasis is on greater diversity of crops, and this is essential for the sustainable development of agriculture. This means we need different kinds of interplanting between crops, trees, and grasses and al-

ternative planting, crop rotation, and also so-called functional planting such as cover crops and soil-building crops (mostly legumes).

The third principle is the landscape pattern - to distribute and arrange different products as agricultural, forestry, and animal husbandry products. This is done basically according to the topography or the geomorphology of the soil substrata, for example, piedmont, alluvial plains, sand dunes, depressions, terraces, etc.

The last principle — that of conservation and sustainability — is perhaps the most important. Before any land-use activity is carried out, an ecological impact assessment should be done. Ecological considerations should always be the first priority and one should never sacrifice ecological and long-term benefits for short-term results. This is the basic principal of sustainable development.

The desert oasis agricultural pattern for Xinjiang basically consists of three components. First, the agricultural oasis as the core of the system. Second, the zone between the oasis and the desert as a buffer and a base for animal husbandry in agricultural areas. Third, the desert is protected for nature conservation and as such is the 'kingdom of wild animals'.

**NEED FOR RATIONAL USE OF WATER  
RESOURCES**  
**Prof. Warikoo**

*Secretary General, Central Asian Studies,  
School of International Studies  
Jawaharlal Nehru University, India*

This paper deals with some of the socioeconomic concerns of Central Asia focussing on current developments dealing with the problems of water resources and their usage in the Central Asian Republics. The deserts and steppes of Central Asia are in a unique geographical

position. Remoteness from the sea, indeed their landlockedness, contribute to their aridity and unique climatic conditions.

Rainfall is scarce and water is a precious resource in Central Asia. Surface water comes mainly from the runoff and melt water produced by high mountain ranges feeding the region's two largest rivers, the Amudarya and Syrdarya, which flow through Uzbekistan, Southern Kazakhstan, and towards the Aral Sea. These two rivers are the main water resources for the entire Aral Sea basin, covering more than a million square kilometres of Central Asian territory and encompassing Uzbekistan, Kyrgyzstan, Tadzhikistan, and southern Kazakhstan where there are more than 30 million inhabitants. These rivers also provide water resources to sustain traditional irrigation systems. In fact the Kharizm, Khargana, and Tarim basins have remained the most flourishing settlements along the Silk Road owing to their irrigation and settled agricultural systems. The distribution of water throughout these three deserts was previously regulated by local village committees which administered the usage of water. These traditional small-scale, sustainable irrigation systems later gave way to large-scale irrigation networks to bring large tracts of arid land under cultivation. Whereas the Soviet policy of cotton monoculture, extension of arable land, construction of large hydro and thermal power projects, industries, and transportation networks brought certain economic benefits to the region, they also caused damage to the local environment to some extent.

Although increasing population and consumption and management of limited water resources are universal problems, they assume critical importance in the huge landmass of Central Asia. Growing desertification, sinking of the Aral Sea, salinisation, and scarcity of water directly affect the ecological balance in

Central Asia. The Aral Sea has shrunk to about half its size and nearly more than 30,000sq.km. of the dry belts are desertified and thousands of tonnes of salt, along with the residues from pesticides, chemicals, and fertilizers, are blown by the wind across hundreds of kilometres. This has resulted in land degradation, desertification, and a decline in agricultural productivity. It has also affected the regional climate, leading to hotter summers and cooler winters; and as a result the growing season is decreasing. The Aral Sea has become a major international, ecological, and socio-economic concern and has been receiving attention from international agencies. The UNDP, European Union, World Bank, and other international agencies are actively associated with projects to save the Aral Sea. Another problem is the evaporation of irrigation water from the Syrdaria and Amudaria and their tributaries and canals. Only half of the irrigation water is available for crops, while the rest evaporates or soaks into the ground during transit.

Coordination amongst the five Central Asian Republics of the Aral Sea basin to regulate the allocation, consumption, and exchange of water is a step in the right direction. However, given the limited water resources and increasing demands for both irrigation and energy purposes, the conflicting water demands of various republics need to be evaluated, keeping in mind the ecological requirements of the Aral Sea basin.

Given the specific problems confronting Central Asia, there is an urgent need to promote efficient and rational usage and to organize the distribution of water to sustain and develop the community. There are several measures that can be considered in this respect.

- ▶ Traditional farming based on crop rotation and judicious use of water, instead of mass production of cotton which consumes a lot of water, should be practised.
- ▶ All those who are engaged in traditional farming (agriculture, horticulture, apiculture, mushroom farming, and sericulture) should receive adequate supplies of water in order to carry out their work. Disruption could force the people to migrate to overcrowded cities without adequate infrastructure, housing, or employment.
- ▶ The new Central Asian emphasis on diversification of agricultural practices is shifting the focus from cotton to grain, vegetables, and fruit. These activities need to be supported, both technically and financially. A multi-pronged approach, differentiating between use of water for drinking, irrigation, and toilets, needs to be adopted. Various steps to ensure optimum use of water resources while at the same time maintaining the ecological balance are necessary to prevent conflict and promote social development as well as economic productivity.

**DEVELOPMENT OF ENVIRONMENTALLY  
SUSTAINABLE AGRICULTURAL SYSTEMS  
IN UZBEKISTAN**

***Dr. Alim S. Pulatov***

*Uzbek Academy of Sciences  
Uzbekistan*

This paper has been prepared as an introduction to the environmental situation and development of different sustainable agricultural systems (technology and machinery) in the plains of Uzbekistan.

Irrigated land comprises about 10 per cent of the territory and produces more than 95 per cent of the total agricultural output. The main crops are cotton and winter wheat. Subsidiary crops are alfalfa, *dzhugara* (sorghum), Indian corn, *bakhch*, vegetables, melon rice, and so on.

As part of the former Soviet Union, the Republic of Uzbekistan was subjected to



a centralized approach to social and economic development activities. Little attention was given to the impact on the environment. As a result, the Republic is faced with severe ecological deterioration.

About 80 to 90 per cent of the water resources available are used for agriculture. Furrow irrigation (flood irrigation in paddy fields) is the current practice. More efficient water use could be facilitated through improved land levelling, introduction of surge irrigation, and other innovations — including on-field drainage. Subsurface irrigation is less expensive, but it is suitable only for perennial cropping systems.

Cotton is one of the main consumers of water, and this has resulted in significant environmental damage in the area. One way to decrease the use of water and of chemicals is to find alternatives to cotton by introducing other crops that consume less water and crop rotations to reduce the use of chemical inputs. By the mid-1980s, the government adopted new programmes to change the cotton monocrop production system and make more efficient use of water.

Intensive irrigation and ongoing farming practices have damaged the shallow groundwater environment in the river basin. The greater proportion of chemicals applied pass through the soil and drainage systems and are then discharged into the surface water, resulting in contaminated rivers.

Irrigated land is mainly located on light soils (poor in humus) that have a more or less marked tendency to salinisation. The loss of water through surface evaporation could be reduced through groundwater development, adding both to irrigation supplies and contributing to increased yields.

Water quality has deteriorated dramatically because of direct drainage into the

river. The main pollutants are the mineral fertilizers and chemicals applied to irrigated land. The amount and type of chemicals present in the drainage water depend largely on the agricultural production systems in the region.

A research and demonstration project was initiated at the research farm of the Tashkent Institute of Irrigation and Agricultural Mechanisation Engineers (TIEIAM) near Tashkent, Uzbekistan, in cooperation with researchers from Iowa State University, with the goals of developing best agricultural practices to control pollutants and conserve soil and water quality in the irrigated areas of Uzbekistan.

The data on chemical concentration in soil samples from the TIEIAM demonstration plot indicate that residual salinisation in the upper reaches consists of insignificant quantities of water soluble salts (from 0.1 to 0.4%). Salinisation is measured according to the amount of chloride ions. Hence, the soil under investigation, which has 0.01 per cent of chloride, is regarded as a poorly salinised soil. Sulphate salinisation is measured according to the amount of sodium (from 0.04 to 0.202). Analyses of groundwater samples show that it is fresh water.

The chemical analyses show that humus and nitrogen contents are within the range for typical serozem soil. A limited number of earthworms is present in this soil. The data on TDS shows that the water is not salty. The balance between anions and cations shows that the groundwater contains chloride, sulphate, magnesium, and calcium. The  $\text{NO}_3\text{-N}$  concentrations in the groundwater, measured in March (before planting), exceeded the Maximum Contamination Level (MCL) three to five fold. During the vegetation period and after several rounds of irrigation, the  $\text{NO}_3\text{-N}$  contents in drainage water decreased sharply. This type of research focussing on sys-

tematic documentation and analysis of findings will help to provide a better basis for decisions about the sustainable use of available natural resources in the region.

**USE AND DEVELOPMENT OF EASTERN  
HIMALAYAN WATER RESOURCES:  
PROBLEMS AND PROSPECTS**

**Dr. Mohan Man Sainju**

*Executive Chairman  
IIDS, Nepal*

The Eastern Himalayan Water Resources constitute one of the world's greatest natural resources. The Eastern Himalayan region stretches across territories in Bangladesh, Bhutan, India, Nepal, and China (Tibet). The region forms the watershed of the Ganga, Brahmaputra, and Meghana (GBM) river systems. The population density is the highest in the plains where the fertile alluvial soil, warm climate, rainfall, numerous streams and rivers, as well as agricultural production have attracted people over the centuries. One consequence of this has been ecological imbalance and deforestation, leading to soil erosion, siltation, and flash floods. The population of the region has doubled during the last 30 years and, if the population of the region continues to increase at the present rate, it may double again in another 30-35 years.

Due to extreme population pressure, the land-person ratio is decreasing with corresponding increase in rural landlessness. The factors leading to poverty in the region are low productivity, underemployment and unemployment, low wages, and low literacy compounded by limited access to education and income-generating opportunities. The critically vulnerable groups affected by poverty are the landless and marginal farmers (owning up to 0.2 hectares of land), disabled persons, the destitute with no access to economic activities, rural non-farm workers, urban slum dwellers, and

the rapidly increasing female-headed households.

The water resources of the GBM region consist of three closely related components, viz., precipitation, stream flow, and groundwater and other water bodies, with stream flow being the largest component. Although availability of water in the GBM basin is sufficient for the diverse needs of the people in the region, the hydrological regime is characterised by extremes of seasonal water surpluses and deficiency. This necessitates the storage and regulation of water behind dams in order to harness it for power, irrigation, inland navigation, management of floods and drought, and promotion of water-based recreation — including fish farming and tourism development.

The potential for hydropower development in Nepal alone is enormous — about 83,000 MW. Out of this, 42,133 MW are estimated to be technically and economically viable. The installed capacity of hydropower stations at present is less than one per cent.

As all the demands for water have to be satisfied in the context of the rising population in the region (expected to reach a billion within the next 30 to 40 years), serious efforts must begin at both national and regional levels. The first phase study, which started in 1990, ended in 1993 with publication of three separate national reports and an integrated regional report. The second phase of the study began in 1995 and is currently underway. The first phase study concludes by saying that, given a cooperative framework and a variety of valuable trade-offs, water sharing in the region can be a very positive action to take.

As in other areas, there is ample scope and need for regional cooperation in the broad area of environmental concerns. Protecting water quality and curbing pollution, treating catchment areas and

controlling sedimentation, protecting wetlands and the eco-system, preserving biodiversity, undertaking reforestation, and controlling salinity are only some among many areas where concerted action from research projects to implement programmes agreed upon is possible.

In conclusion, the study argues that, if there is one outstanding fact that emerges, it is that regional cooperation in the harnessing of the eastern Himalayan rivers, home to the biggest concentration of the world's poorest, offers gains to all the countries far beyond anything that can be achieved by isolated national efforts.

The Eastern Himalayan region is too poor to afford further loss of time. The waters of the Ganga, Brahmaputra, and Meghana constitute an abundance of wealth and energy that must be creatively and cooperatively used.

**SUSTAINABLE DEVELOPMENT OF THE  
MAIN STREAM OF THE TARIM RIVER**  
**Prof. Fan Zili and Ji Fang**

*Xinjiang Institute of Ecology and Geography,  
Chinese Academy of Sciences*

Tarim River, the longest inland river in China, is 1,321km long. It is located in the northern part of the Taklimakan Desert. Although this region is rich in water, land, light, heat, and biological resources, its ecosystem is fragile. In past decades, increasing human activities, especially over-irrigation, have led to a degraded environment, thus hampering regional economic development severely. The main environmental problems are discussed below.

**Decrease in the Volume of Runoff  
in the Main Stream of the Tarim  
River**

The river watershed provides the main base for agriculture in Xinjiang. Since 1949, industry and agriculture have

made significant progress. With growth in population, extension of cropping areas, and augmentation of economic activities, water consumption has increased significantly, resulting in a decrease in volume of runoff in the main stream of the Tarim River. The river has dried up completely in the lower reaches. The groundwater level of the lower reaches was three to five metres in the 1950s and had gone down to eight to 13 metres by the mid-1990s.

**Salinisation of Water**

Over-irrigation results in a rise in groundwater and salinisation of land. To relieve this, farmers drained off more water into the River Tarim and hence the degree of mineralisation in the river waters rose. The periods of mineralisation also increased from five g/L lasting only one month, in the mid-1970s, to two months in the mid-1980s and three months in the mid-1990s.

When water use and cropland increased, it gradually brought down the levels of mineralisation because it is the main region for cotton production. It is difficult to reduce water consumption in Xinjiang. The management option is to decrease the volume of runoff from the source flows and ensure adequate water supplies to the main stream.

**Engineering Control and  
Canalisation in the Main Stream  
of the Tarim River**

Another source of concern was waste water. There are 137 openings along the main stream. Most of them were non-engineered and it was difficult to control water discharge. One hundred and twenty-two of these were for animal husbandry and these added to the waste water. To lower water consumption, bank protection was undertaken, permanent inlet controls constructed, and the temporary irrigation openings along the entire river were blocked.

## Water-saving Irrigation

Tremendous potential exists to save water. The objective is to increase efficiency of usage. Anti-seepage channels, which now cover only 20 per cent of the irrigation channels, can be improved. In Qara-Tikanlik irrigation district, irrigation channels have been extended by 35 per cent, thus saving water.

## Integration of Farming with Animal Husbandry in the Middle Reaches

Nomadic herdsmen rely on traditional production, which is low in productivity, forcing people to live in poverty. There is a need to change living standards and the way of life. This has led to the settlement of nomadic herdsmen with better integration of farming with animal husbandry.

## Increase in Desertification

From aerial maps of Aragan, taken at different times, it is clear that desertification is on the rise (from 1,371.22sq.km. in 1959 to 1,494.32 sq.km. in 1996). The annual growth rate is 0.24 per cent. Vegetation losses are accelerating and the most recent decrease has been seen in the Euphrates' Poplar (*Populus euphratica*). Efforts are needed to restore the balance.

## Principles of Sustainable Development

The Tarim River flows through a relatively backward area that is also ecologically fragile. Development efforts have focussed on improving the economy without harming the environment, balancing present and long-term interests, increase in quantity, and maintaining a better integration of ecology, economy, and society. Coordination is critical for a more dynamic equilibrium between population, resources, environment, and economy and the distribution of re-

sources, based on social equity in time and space and thereby preventing unreasonable use of water and other resources.

## Measures for Sustainable Development in the Mainstream of the Tarim River

- ▶ Controlling water use in source flows and ensuring water supplies to the mainstream of the Tarim River
- ▶ Efficient agriculture with people diversifying from cotton to fruit (korla pear) and deer breeding. All these have proved profitable and reduce the pressure on water. Similar approaches should be promoted.

### WATER PROBLEMS IN SEMI-ARID AND ARID REGIONS OF NORTHWEST CHINA

**Prof. Lui Cheng Ming**

*Chinese Academy of Sciences*

In China, there is conflict in water management because the land and water distribution is not balanced. There is more cultivated land but less water. Uneven distribution of water is a result of the uneven precipitation which is concentrated more in the south. Half of the northwest area is threatened by desertification. The concentration of population coincides with water distribution, and the agricultural sector consumes most of the water. Environmental degradation on land as well as in water bodies is on the increase. The main water-related problems in the oases are desertification and salinisation. Water pollution and management and distribution of water also pose major problems.

Sustainable development should be the ultimate goal of each country and development of water resources and human activities should focus on the following.

- ▶ Sustainable socioeconomic development

- ▶ Better understanding of the volume of water available
- ▶ Monitoring of the environment and the ecology
- ▶ Water saving
- ▶ Optimal allocation and reallocation of water supplies
- ▶ Unified water management based on assessment of demand

The main conclusions that emerge are the following.

- ▶ In arid and semi-arid regions, water and the environment are mutually dependent.
- ▶ The supply of water must meet development needs. Development should be adaptive.
- ▶ Harmonious development planning is needed for sustainability.
- ▶ International cooperation is helping in the Central Asian countries.

#### **THE PROBLEM OF WATER DISTRIBUTION IN CENTRAL ASIA**

***Dr. Erkin Orolbayer***

*Chief, Energy Department  
Kyrgyz Republic*

The essence of the problem is that the geographical distribution of water is very unequal in the region. The main water resources are found in the mountainous countries, e.g., Kyrgyzstan and Tadjikistan, and the water is mainly used by other countries in the region. This was never a problem in the time of the former Soviet Union, but after independent states were established, the costs for the countries in which water resources originate became quite high. With the current economic crisis in all the CIS countries, this is an additional burden. As it is becoming an urgent problem, Kyrgyzstan has introduced a common approach to the problem. Its two main tasks are: first a regional agree-

ment on core financing of hydro-technical facilities and a second regional agreement on the sale of water or sale of services to distribute water. Bilateral and multilateral negotiations are very important in this context.

The President of Kyrgyzstan has issued a decree regarding external policies for sharing the rivers originating in Kyrgyzstan and going to neighbouring countries. Until recently these negotiations have not been successful, but now we can be optimistic. After independence, the countries tried to be self-reliant in energy. Recently, representatives of the Central Economic Committee have made more efforts to negotiate inter-governmental agreements, as well as the norms for water distribution and supplies of gas and coal. In addition, during the meeting of the Presidents of Central Asian states, a decision was taken to establish an international water-energy consortium to discuss inter-state water strategies. I hope this consortium will take into consideration opinions and experiences shared at international conferences such as this one.

#### **Summary and Conclusions**

A sustainable ecosystem can be developed and, in oases, marginal zones can be made more productive as grazing land if proper water management is adopted.

With regard to the problems and potentials facing water management in Central Asia the following can be said:

- ▶ diversification of crops is needed;
- ▶ water management practices should take traditional water management practices into account - practices that were often very useful;
- ▶ reallocation of water to different users should be considered;
- ▶ re-use of waste water is essential; and
- ▶ regional cooperation in management of shared water resources is essential.

The environment and the water resources of Uzbekistan have deteriorated owing to the forced increase in irrigated areas and cotton monocropping. A demonstration farm tried to introduce more sustainable agricultural and water use practises but faced problems of acceptability from farmers, and co-operatives lack knowledge and understanding and are economically in a difficult position. Environmental awareness should be promoted and research should provide and demonstrate alternative techniques in which farmers are to be trained.

There has been a dramatic reduction in river flow. There has also been an increase in salinity in the Tarim River during the last 20 years, and excessive land reclamation without proper drainage systems. The solution is to control water extraction at the source, use water saving techniques, control water use and seepage, and use an efficient irrigation system, proper drainage, and canalisation of canals (lining). Crop diversification and increase in area covered by pastures would also help to solve the problem.

To improve the water situation in China, among other things, water pricing and better regulation of water extraction are of paramount importance.

To improve the water resources overall in Central Asia, the following steps are suggested.

- ▶ Environmental impact assessments are a must before undertaking any action.
- ▶ Diversification and rotation of crops are required.
- ▶ The use of agro-chemicals should be reduced.
- ▶ Efforts should be made to increase efficient irrigation.
- ▶ Campaigns to enhance general awareness about water scarcity are recommended as well as training and education for farmers in more efficient use of water.
- ▶ Water allocation and water pricing should be introduced.
- ▶ Interstate communications about water use is essential (the World Water Council is perhaps a useful vehicle).

The technical, environmental, and social conditions in the Eastern Himalayas are tragic. The water resources available are not well used and not well distributed. The hydropower potential is tapped to the extent of about one per cent. River and water management should be instituted in an environmentally-acceptable way and for this inter-governmental agreements are required. NGOs play a part and are recognised as useful vehicles to bring about necessary changes.



# Land Management

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## **Introduction**

The arid climatic conditions in Central Asia dictate the types of land use, and these are:

- ▶ rangeland for grazing cattle, and
- ▶ irrigated agriculture where water is available.

Without irrigation, no agriculture with acceptable yields can take place in most parts of the region.

Irrigated agriculture is found mainly in the Fergana Valley and in the basin of the Aral Sea where, thanks to the two great rivers, the Amu-Darya and Syr-Darya, about 4.5 million hectares are irrigated, representing about half of the total irrigated area in Central Asia.

Under Soviet rule, the irrigated area in the Aral Sea basin was extended (originally in 1960 some 2.3 million hectares were under irrigation) in order to cultivate cotton. This area was to be the main

supplier of cotton for the whole of the Soviet Union. Since the Aral Sea crisis, cropping has diversified, with winter wheat becoming one of the main crops.

Both rangeland and irrigated land cultivation are over-exploited land uses that have led to a deterioration in the natural ecosystem.

Land degradation is a result of soil erosion, desertification, waterlogging and subsequent salinisation and, less obviously, a result of the reduction of organic matter in the soil. The soil organic matter content declined because of intensive cultivation and also because of deforestation.

- ▶ In the irrigated areas of Uzbekistan, for instance, the soil organic matter (OM) content declined by 30-50 per cent due to intensive land use over the last 40 years. Today, soils with poor and very poor OM content (from 0.4 to 1%) account for 40 per cent of the irrigated area. The total area with



various kinds of erosion covers 31 million hectares or 69 per cent of the country.

- ▶ In Kazakhstan 179.9m ha or 60 per cent of the republic are at present covered by land going through the desertification process.
- ▶ Even in relatively scarcely populated regions, such as the Tian-Shan the areas under forests have declined, vegetative regeneration has ceased, and progressive degradation of mountain pastures has been observed during the past 30 years.

In order to restore degraded lands, it is first necessary to identify the causes of degradation. Models have been developed that take into account the following aspects:

- ▶ water harvesting,
- ▶ agro-forestry,
- ▶ afforestation,
- ▶ people's participation, and
- ▶ bio-prospecting.

Testing of models for the Gharwal Himalayas by the GB Pant Institute for Himalayan Environment and Development, located in Srinagar, Uttar Pradesh, India, has been successful and has led to the conclusion that eco-restoration and conservation of natural resources are feasible.

Management information systems (MIS) can quantify, at any moment in time, the situation of land resources. It is a handy tool that can assist in preventing degradation of agricultural land.

On the national and international levels, plans have been developed to combat land degradation.

For example, in accordance with the UN Agenda 21 resolution, a National Strategy was developed in Kazakhstan, which provides measures for sustainable land management focussing on:

- ▶ land protection from water erosion, wind erosion, humus depletion,

swamping, and secondary salinisation;

- ▶ restoration of the fertility of arable land ranges and hay meadows and reclamation of lands disturbed by various activities;
- ▶ forest preservation and development; and
- ▶ conservation of biological diversity.

In Uzbekistan, alternative cultivation techniques have been developed to improve agriculture and replace the use of pesticides. This is done partly out of environmental concern and partly out of necessity, as pesticides are difficult to acquire, and there is no money to pay for them.

### **Major Issues and Experiences**

#### **THE ROLE OF MOUNTAIN TERRITORIES IN SUSTAINABLE DEVELOPMENT OF CENTRAL ASIA**

**Prof. I.V. Severskiy**

*The Institute of Geography,  
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There are many problems in the different mountain territories of Kazakhstan. Some of these originate outside the country and some within the country. Some problems have been present for a long time, while others are relatively new and have arisen with the break up of the Soviet Union and the current economic change. The main problems are anthropogenic in origin and were caused by industrial pollution, resulting in air and chemical pollution and soil damage. Other problems, such as overgrazing, are caused by mountain communities. The consequence of all these is the contamination of water supplies.

Within the borders of southern and eastern Kazakhstan, the total area of mountains above 1,000m is more than 160,000sq.km. The problems of mountain territories of Kazakhstan have always attracted the attention of scientists.

Most of the present data on the mountains of Kazakhstan were obtained through the efforts of scientists from the institutes belonging to the academies of Geography, Geology, Botany, Zoology, Soils, etc.

### **The Main Research Priorities**

The most important research issues are as follow.

- ▶ Estimation of renewable water resources in the mountains and anthropogenic impacts on run-off
- ▶ Problems of interstate water sharing and transborder water and air pollution
- ▶ Problems of surface and groundwater interaction
- ▶ Estimation and prediction of climatically and anthropogenically caused changes in natural processes and phenomena that affect the dynamics of mountain geosystems
- ▶ Control of anthropogenic impacts (including recreation) on mountain geosystems
- ▶ Problems of natural hazards
- ▶ Socioeconomic and demographic problems in the mountains and on the adjacent plains
- ▶ Integrated monitoring of mountain territories
- ▶ Problems of geopolitics, including development of frontier lands in mountain countries

In the current condition of an economic crisis in Central Asia, it is difficult to expect adequate support for research on the above-mentioned problems. The situation is unlikely to improve greatly in the near future. In this situation, the following tasks are the most important.

- ▶ Interstate coordination for research on the problems of mountain territories, with support from international organizations
- ▶ Organization of research in comparative geography under international projects

The mountains are unique territories for the countries of Central Asia because an overwhelming part of the water resources and practically all renewable resources of fresh water in the region are formed here.

Steady degradation of mountain geosystems, decline in socioeconomic conditions, and complex demographic changes characterise the current situation in the majority of mountain areas of Central Asia.

### **BASIC STRATEGY FOR SUSTAINABLE DEVELOPMENT: CHINA** **Liu Dong Sheng**

*Chinese Academy of Sciences*

In an arid region, such as Xinjiang, sustainable development of agriculture, forestry, animal husbandry, and other sectors needs to proceed with scientific assessment, detailed planning, and careful management of the fragile eco-geological system. However, to achieve these objectives, knowledge of the physical environment of the region is needed to promote awareness of the principle of coordination between the natural process and human activities.

In China, arid areas occupy the desert region and the eastern part of the Loess Plateau. The structural geological processes influence the environment. Xinjiang region is not as arid as the southern part of China. However, with the uplifting of the Tibetan Plateau and the beginning of the monsoon from the southeast and southwestern parts of the oceans, the eastern part has a monsoon climate while the northern part of Xinjiang is becoming drier and drier. During the Ice Age in Europe, there was only a one degree decrease in the average temperature and this caused loss of harvests and forced people to move from north to south. The greenhouse or other effects of climate change are very important parameters in planning.

The arid regions of China are not as cold as one might expect and, in fact, during July it is higher than in other regions. Changes in the temperature in different seasons are very important for the development of agriculture. It is also important to note the average precipitation, which does not vary as much in January for the whole country as it does in July. The east receives a lot of rain in July. Runoff is also very important. The annual runoff in the western arid region does not differ greatly from that in the east, but it is important to examine the seasonal differences.

If the temperature drops by five degrees or the precipitation increases by 10 per cent, then striking differences in vegetation between the arid and other regions can be observed. Natural hazards, such as hailstorms (including cold air currents), also have to be considered. In China there is a big difference between the farmlands of the northeast and southwest. Ninety-five per cent of the people live in the eastern part and only five per cent in the west. This should also be considered in any planning exercise for the region.

Industrial development in China also demonstrates sharp contrasts from the east to the south. Planners and decision-makers have to take into account not only the natural background but also the socioeconomic characteristics of the region for any type of strategic development in Central Asia.

**SUSTAINING THE RANGELAND OF  
CENTRAL ASIA - A GLOBAL  
PERSPECTIVE**  
**Cees de Haan**

*The World Bank, Washington D.C.*

The transition to a market economy in Central Asia offers an opportunity to establish sustainable pastoral production (the complex of range, animals and human, and rangelands) in the region, but it could also lead to land degradation.

A number of significant emerging trends in the pastoral sector in Central Asia has been identified and, based on experience elsewhere, some alternative ways of addressing these trends can be identified. The focus is on the four criteria for sustainable pastoral production as the organizing principle. They are elaborated upon below.

### **Ecological Soundness**

It is recommended that, while introducing appropriate land tenure policies and improvements in marketing, the characteristics of the customary pastoral system that are ecologically sound should be maintained and strengthened. This includes herd and flock mobility and continued access to those resources of critical importance to the system (water, summer or winter meadows).

### **Economic Viability**

Emphasis should be on adopting policies that favour market-based pricing for inputs and products, equitable taxation of the pastoral sector, diversification of range production, and, under most conditions, the creation of alternative employment outside the pastoral sector.

### **Social Acceptability**

It is suggested that there should be strong participation of the target population in decision-making about range policies and improvements; and that implementation should be decentralized.

### **Political Support**

A strong argument should be made for the establishment of regional and national pastoral associations to give support to a policy framework for sustainable rangeland use.

The World Bank is funding pastoral development in several parts of the world along these lines.

## STAKEHOLDERS IN SUSTAINABLE LAND MANAGEMENT

**Prof. Chen Guangwei**

*Chinese Academy of Sciences*

Who is responsible for land degradation? Who is responsible for sustainable land management (SLM)? It is, after all, a set of people. One should first and foremost understand the concept of sustainable land management. SLM is an important topic in the world, and more so for China. SLM is the kind of land management that maintains the services and quality of the environment at the same time. As a goal and vision, SLM is closely linked to sustainable development. A set of indicators serves to define the components of SLM: land productivity, security, protection, viability, and acceptability.

The key problems threatening SLM are: land degradation, availability of water, pollution, and loss of biodiversity. SLM can be practised at different levels: national, regional project, community, and household. Multi-level stakeholders have different interests, influence, power, and risks in decision-making for SLM. There is a multi-dimensional perspective and approach to SLM in China.

China's land resources consist of:

- ▶ a fairly large area with 9.60 million square kilometres,
- ▶ three great areas: lowland and hills, plateaus and basins, and the roof of the world,
- ▶ overlapping tropical, sub-tropical, warm temperate, temperate, and cool temperate zones and the Tibetan-Qinghai Plateau.

### Key Problems

Seven per cent of the world's farmland feeds 22 per cent of the world's population. Yet the question remains. Who will feed China? Land ownership/land use rights should be reformed. Soil erosion is a critical problem in China. About 1.83

million sq.km. are subject to soil erosion. Five billion tonnes of soil are washed away each year. The most severely affected areas are the Yellow River basin and the Yangtze River basin. Another problem is desertification. About 2.62 million sq.km. are suffering from desertification. The most severely affected areas are the western-most part of China and the area along the Great Wall on the north.

Over-grazing, over-cutting, and over-harvesting also pose serious problems. Over-grazing is common on grasslands, and there is over-harvesting of medicinal herbs and over-cutting of fuelwood. The forest cover has decreased from 30 to 40 per cent in the upper reaches of the Yangtze River. Pollution is another major problem, 50 per cent of the large rivers are polluted and solid waste and waste water are not properly treated in the cities. Land pollution, due to over-use of chemicals, has degraded the quality of productive land. Urbanisation occupies a vast area of farm land and about 330,000ha of farm land are converted to non-agricultural uses each year. China has 270 billion cubic metres of water, but there is a water shortage in the west and northwestern parts of China. In addition, there is increasing population pressure. Thirteen million people are added each year at the rate of one per cent. By 2050 AD, China's population may reach 1,600 million.

Taking all of the above into consideration, it is of paramount importance to call all the stakeholders to participate in sustainable land management in China. In order to do so, it is important to identify stakeholders, mobilise them for participation, and define the role of each so that there is an understanding of the complexity of sustainable land management and sustainable development. Stakeholders should learn to communicate and develop bargaining skills for negotiations, compromise, and to resolve conflicts.

Clearly the government should also play an important role, not only as a stakeholder, but also as a facilitator of the entire process.

By actively participating in SLM, the stakeholders will be participating in decision-making processes for overall sustainable development.

#### LAND USE AND IMPROVEMENT OF NATURAL PASTURES IN KYRGHYZSTAN

**Dr. Dzholdoshev K.D.**

*Kyrgyzstan*

The Republic of Kyrgyzstan is a mountainous country. Eighty-seven per cent of its agricultural land is natural mountain pastures. Therefore, the ecological situation of the country depends to a great extent on the condition of these pastures. There are 8.5 million ha of natural pasture and 234 thousand ha of hay meadows. The natural fodder base is mainly located between altitudes of 600 to 4,000masl. There are high mountain pastures (2,600-4,000m) with a total area of 4.1 million ha. Among the high mountain pastures 1,9 millionha are at altitudes between 3,000-4,000masl. Natural pastures are very diverse. One can classify them according to their botanical diversity, their productivity, and their fodder value as well as their soil and climatic conditions and altitude.

The most common types of pasture in the desert and semi-desert areas are *Artemisia*-steppe and in steppe areas *Stipa* and *Festuca*-steppes. One can divide pastures and hay meadows according to their vegetation; viz, into deserts, semi-deserts, steppe, grass-steppe, and grassland (long grass, subalpine, alpine). There are 3.1m ha of steppe, 2.4m ha of grass-steppe, 1.3m ha of grassland pastures, 1.4m ha desert pastures, and a small area of high mountain tundra (0.15m ha). By seasonal use there are: spring - autumn pastures (2.7m ha -

30%), summer pastures (3.6m ha - 44%), and winter pastures (23m ha - 26%). Currently the productivity of the summer pastures is 5.7 dt/ha from, 3.9 dt/ha in spring - autumn pastures, and 2.3 dt/ha in winter pastures.

The excessive pressure from livestock during the past and the unsystematic use of pasture have led to a sudden decrease in the productivity of pastures. More than one-third of the pasture area has weeds with bushes growing and 1.7m ha are degraded, of which 170 thousand ha are seriously degraded. The ecological balance has been disturbed on most of the pasture land. To improve the situation in the mountainous areas of the Republic, a programme to improve the pasture lands and meadows by killing the weeds and bushes, controlling the use of mineral fertilizer, optimising land use, and introducing irrigation has been developed.

The evaluation of experimental data shows that the right time to use the pastures is when the livestock are able to use the biomass. In Kyrgyzstan this is about 25 to 35 days after the snow has melted or 18 to 20 days after the beginning of the vegetation period. During that time the pasture vegetation has a very high feed value (share of protein to 11-12%). The coefficient of usage for grass-steppe is 58 per cent in the beginning of June, 42 per cent in the middle of July, and, at the end of July, only 36 per cent. Not less important is the determination of the grazing period. Research has shown that desert pasture, steppe pasture, and grassland pasture can only be used once during the vegetation period, while double usage causes degradation and decrease of productivity in following years. It is possible to use subalpine and alpine pastures twice a year. Pastures in Kyrgyzstan have very severe weed problems. In grasslands and grass-steppe pastures there may be a 70-90 per cent coverage by weeds such as *Caragana*. Scientists

have tested herbicides to destroy all these weeds.

Because of the declining number of livestock, especially sheep, and the small size of privatised farms, there is little usage of summer pastures. This could lead to an improvement in pasture conditions, but this has not taken place. Weeds grow faster than fodder plants.

In areas close to settlements, the worst conditions prevail on the spring-autumn pastures. This is because the number of livestock is six to seven times higher than the limit. The process of degradation is continuing. The declining ecological situation hastens desertification. Researchers from Kyrgyzstan have successfully carried out many improvements on the fodder value of pastures by using various species (such as *Agropyron* and others) adapted to arid climates.

There are about 100 thousand ha of pasture land in Kyrgyzstan. These can be irrigated (at an altitude of 2,000-2,500masl) in the winter pasture zone in the valleys of Kara-Kudzhur, Alaj, Arpa, Tonskije, and Dzhetty-Oguzskije syrty. In these high mountain valleys, a non-profitable barley crop pattern prevailed. The performance was very poor. Wind and water-based soil erosion persisted. Scientists have found other methods of irrigating meadows through which the productivity would be between 50 and 60 dt/ha of high protein hay. However, these methods have not been implemented yet.

**DESERTIFICATION AND REHABILITATIVE STRATEGIES IN CHINA**  
**Ci Longjun**

*National Bureau to Combat Desertification  
China*

In 1994 'The United Nations Convention to Combat Desertification in Serious Drought Occurred and/or Desertified Countries, especially in Af-

rica' (hereafter simplified as 'CCD') provided 'Desertification' with a clearer definition:

*"desertification indicates land degradation and an arid, semi-arid, and dry sub-humid areas caused by many factors including climate change and human activities. 'Land degradation' indicates reduction of biological or economic(al) [sic] productivity and complexity or loss of rain-fed land, water-irrigated land, rangeland, pastureland, forest, and woodland in arid, semi-arid, and dry sub-humid areas due to land utilisation or one force or several forces combined. These include: (1) wind erosion and water erosion causing soil material loss, (2) deterioration in soil physical, chemical and biological characteristics or economical characteristics, and (3) long-term loss of natural vegetation'. 'Arid, semi-arid and dry sub-humid indicate areas in which the difference between annual precipitation and potential evapotranspiration is in the range of 0.05 to 0.65, and polar and sub-polar areas are excluded."*

Based on information from the UN, desertification has already had impacts on one-fifth of the world population and one-third of the earth. Desertification has brought serious catastrophes to the global environment and people's lives in many developing countries. It has become an important factor behind poverty and is hindering economic and social development.

China is one country that has been seriously affected by desertification. In NW China, the northern part of Central-North China, and the west of NE China, there are large areas of arid, semi-arid, and sub-humid arid regions. The environment is extremely fragile. Under the increasing population pressure, land desertification is becoming severer and causes serious damage to the local environment and the socioeconomic development of the local people.

The Chinese people have a long history of combatting desertification, and the central government has attached great importance to combatting desertification since the early 1950s.

However, a large-scale project to combat desertification, began at the beginning of the 1990s covering the whole country. In 1991 and 1993, the State Council convened the Lanzhou and Chifeng conferences on preventing and combatting desertification. After the Lanzhou conference, the State Council approved '1991-2000 National Combatting Desertification Overall Planning Key Outlines' [sic]. These tried to integrate prevention of desertification into national economic and social development planning. Later, the Ministry of Forestry compiled the '1990-2000 National Combatting Desertification Project Overall Planning' [sic] based on 'Overall Planning Key Outlines'. In 1994, the central government authorised the Ministry of Forestry to take charge of combatting desertification and of setting up the China Coordinating Group to Combat Desertification. To improve capabilities to overcome desertification, the China Desertification Monitoring Centre, China Training Centre to Combat Desertification, and China Research and Development Centre to Combat Desertification were established in 1994. Since the seventh five-year plan, science and technology projects to tackle key problems related to desertification have been carried out. The government has already placed it in the ninth five-year plan period and listed it in the National Scientific Research Plan.

Through the joint efforts of all related institutions, the rehabilitation of desertified land in China has been incorporated into the National Social and Economic Development Plan. In desertified areas, rehabilitation of vegetation, rangeland construction, and soil conservation have progressed con-

siderably. Many practical techniques and experiences, as well as models of development and management, have been developed. These include biological fixation of shifting sands, planting sand along railways, arable land construction through flattening dunes through flooding, planting trees and grass by aerial seeding on sandy land, rice cultivation on sand dunes, integrated management of small watersheds, rational rotation grazing, and livestock industry based on grass yields. Artificial oases have been created in arid and semi-arid areas. Today, in the marginal areas, sand dunes have been stabilised and more crop farming activities have developed. The regional eco-environment is improving in many areas'. Socioeconomic development is taking place and local people's living standards have been raised.

**LAND AND WATER RESOURCES IN THE  
INDIAN HIMALAYAS: ISSUES OF DEVELOPMENT, USES, SUSTAINABILITY AND  
PEOPLES' DIMENSION**

**T. N. Dhar**

*President, SHERPA*

*India*

Everyone in India talks about the deteriorating environmental and development situation in its Himalayan regions. The Himalayas comprise nearly one-fifth of the total geographical area of India. These hill regions have steep climatic gradients varying from sub-tropical to arctic and ranging from 300 to 8,000m. Most of the hill populations depend on primary occupations such as agriculture, animal husbandry, horticulture, plantation crops, vegetable growing, floriculture, and extraction of forest produce. More than four-fifths of the work force are engaged in primary occupations. The secondary and tertiary economic activities are rather limited. In recent years, however, the development of tertiary services, such as transportation, tourism, and so on, has been somewhat marked.

More than 40 million people live in this region. Around one-eighth of the land is under some form of agriculture, and it is mostly rainfed. As a result of increasing human and animal pressures agriculture has been extended on to steep slopes. The quality of forest cover and pasture land has deteriorated. There is an acute fodder shortage. Productivity levels, except in some foothill areas (called the *Terai*), are very low. The water regimes are under stress. Bio-diversity is under assault and many other negative socioeconomic and political impacts are visible.

Most of the impacts have been adverse as a result of unplanned land and water use, cultivation on steep slopes, deforestation, encroachment on to forest lands, badly implemented engineering activities (e.g., construction of roads, dams, canals), very poor maintenance of village/community forests, cutting down of broad-leaved plant species, inappropriate agronomic practices, shifting cultivation, environmentally hostile tourism, and forest monocultures. In biological terms there is reduced biodiversity and many species of plants and animals have either become extinct or are on the verge of becoming so. Socioeconomically hill populations are poor, some are even isolated. Their nutrition levels are low and they suffer from many endemic diseases. The situation of women is particularly affected.

Most of the land in the hills has no irrigation facilities. For more than three-fourths of the land under cultivation, rainfed agriculture is practised. The possibility of bringing substantial areas under additional irrigation are by no means promising. A little over one-tenth of the geographical area in the Himalayan regions is under cultivation. Barring some exceptions, and excluding cultivation in the *Terai* areas, productivity is quite low.

In the Himalayan states, livestock are an essential and important component

of overall land use. They are central to agricultural development and land fertility. The number of cattle, buffaloes, sheep, goats, and pigs is over 20 million; and the dominant category is cattle, mostly maintained for draught power, meat, milk, wool, and hides. Genetically the livestock are of very poor quality and they face widespread nutritional shortages and imbalance.

Shifting cultivation is practised mostly in the North-Eastern Himalayan states where it is a big problem. It is reported that alternative land uses, such as pasture development, horticulture, introduction of cash crops, and other similar programmes, have started making an impact in recent years. As a result of this, areas under shifting agriculture have decreased slowly but perceptibly. Slash-and-burn is a traditional farming system. It used to provide a basis for subsistence farming, maintenance of cultural values, and social stability when population densities were low.

The most important rivers in northern India emerge from the Himalayas and have very large basins. Yet, it is a fact that, because of the seasonality of precipitation and inadequate water storage capacities, most of the river waters flow down to the plains and then to the sea. Only a small amount of the water available is harnessed for productive and consumption purposes. Management of that water has to be an important focus of any protective and regenerative strategy in the mountain regions where water and soil are interlinked. Any successful planning should ensure optimal percolation and sub-surface flow with a view to recharging groundwater and reactivating springs and water sources: only in this way will year round supplies be ensured.

The core strategy should be a combination of protection, regeneration, and production. This can be achieved by adopting an integrated watershed management approach incorporating micro-



planning, integrating resource use, and facilitating decisions by local communities.

Land and water uses and natural resource management in hill areas need change. Changes are difficult to bring about. The problems are lack of education, of persuasion, of mobilisation, and of compensatory actions when changes involve loss of income or curtailment of resources. Mobilisation of people involves organizing communities for planned action. It implies holistic and coordinated approaches to development in which communities initiate, through internal and external stimuli, and take part in the process of development.

The ecological and economic health of the Himalayan States of India is important, not only for the region itself but also for the vast Indo-Gangetic plains below that constitute the granaries of the country and which can generate surpluses for other countries as well. These fertile plains receive water and soils from the great range of mountains above. This hill-plains' interdependence means environmentally-friendly, people-responsive sustainable development in the Himalayan regions of India is of the utmost importance. Economic growth and diversification are needed in the mountains. The ecological foundations essential for sustainable advances in land and water conservation; in crop, animal, and biomass production and productivity; and in off-farm employment and human resource development will need to be secured in every way possible. This implies adequate resource allocation at the state and national levels and substantial international cooperation and assistance.

### **Conclusions**

Much remains to be done. Environmental awareness is growing everywhere, albeit more at the non-government than

at the government level; often because governments have other priorities. Given the similarity of problems, it would be a good idea for the region to cooperate in combatting the problems. An Interstate Council should be set up similar to the one established in 1992 by the five CIS countries in Central Asia to tackle the Aral Sea crisis. Such an Interstate Council could develop a joint programme to attract funds from international financing agencies.

The programme should be based on a proper up-to-date inventory of soils in the region. Given the two principal land uses, the programme should focus on stock farming and irrigated agriculture. In the case of stock farming, overexploitation of grazing areas should be controlled by reducing the number of cattle, so that the ecological balance is restored.

In the case of irrigation, efficient water use is essential to control waterlogging and the resulting salinisation of soils. The use of agro-chemicals should be reduced to the minimum and be replaced by alternative cultivation techniques.

The presentation dealing with land management and the discussions that followed raised the following points.

### **Need for Inter-state Cooperation**

There were many common problems concerning transboundary implications in sustainable management of land resources. The historic regional cooperation demonstrated in managing the Aral Sea crisis has now to be replicated by similar inter-state bodies for the management of fragile land resources in the region. While each country should undertake appropriate measures within its boundaries, because of the close environmental relationships, countries should work together to develop sustainable solutions.

### **Prioritisation**

Because of the economic transition and the difficulties being encountered, governments did not always give adequate priority to sustainable management of land resources. The emphasis was still on exploitation of available land in spite of the problems experienced in the past.

### **Increased Awareness and Understanding of Land-related Problems**

Local inhabitants did not readily understand the need for conservation and sustainable use of land resources. Once there was better understanding of the reasons, cooperation from the people was also stronger. Problems caused by misuse of irrigation, water logging, salinisation of soils, and soil pollution from agrochemicals were aspects requiring better understanding than herebefore.

Scientific information in the region was generally much better than in other areas. Yet organizations responsible for such information were facing problems in terms of support. Recent changes in the conditions of the land resources needed careful monitoring, a comprehensive inventory for soils was essential, transboundary pollution of water and therefore of soils needed monitoring, and many other problems needed new research initiatives.

### **Climate Change and Land Use**

It was generally believed that the region's climate was changing, but its overall direction and the factors behind the change needed further investigation. The impact of wind erosion and larger volumes of sand in the air required close study. The implications of changing climates on oases and limited agricultural land could be far reaching.

### **Documentation, Testing and Replication of Innovative Technologies and Practices**

The countries in the region were already developing many innovative technologies and practices in different aspects of land resource management dealing with crops, soil conservation, desertification control, efficient use of water resources, and many other areas. Many of these were known only to the specific projects developing them. Countries could benefit immensely from sharing this information with each other.

### **Customary Practices and Indigenous Knowledge**

Many customary practices are not only environmentally friendly but also make efficient use of locally-available resources. In many areas, such knowledge is disappearing rapidly and efforts must be made to document them and explore their continued use by the community.

### **Sustainable Land Management**

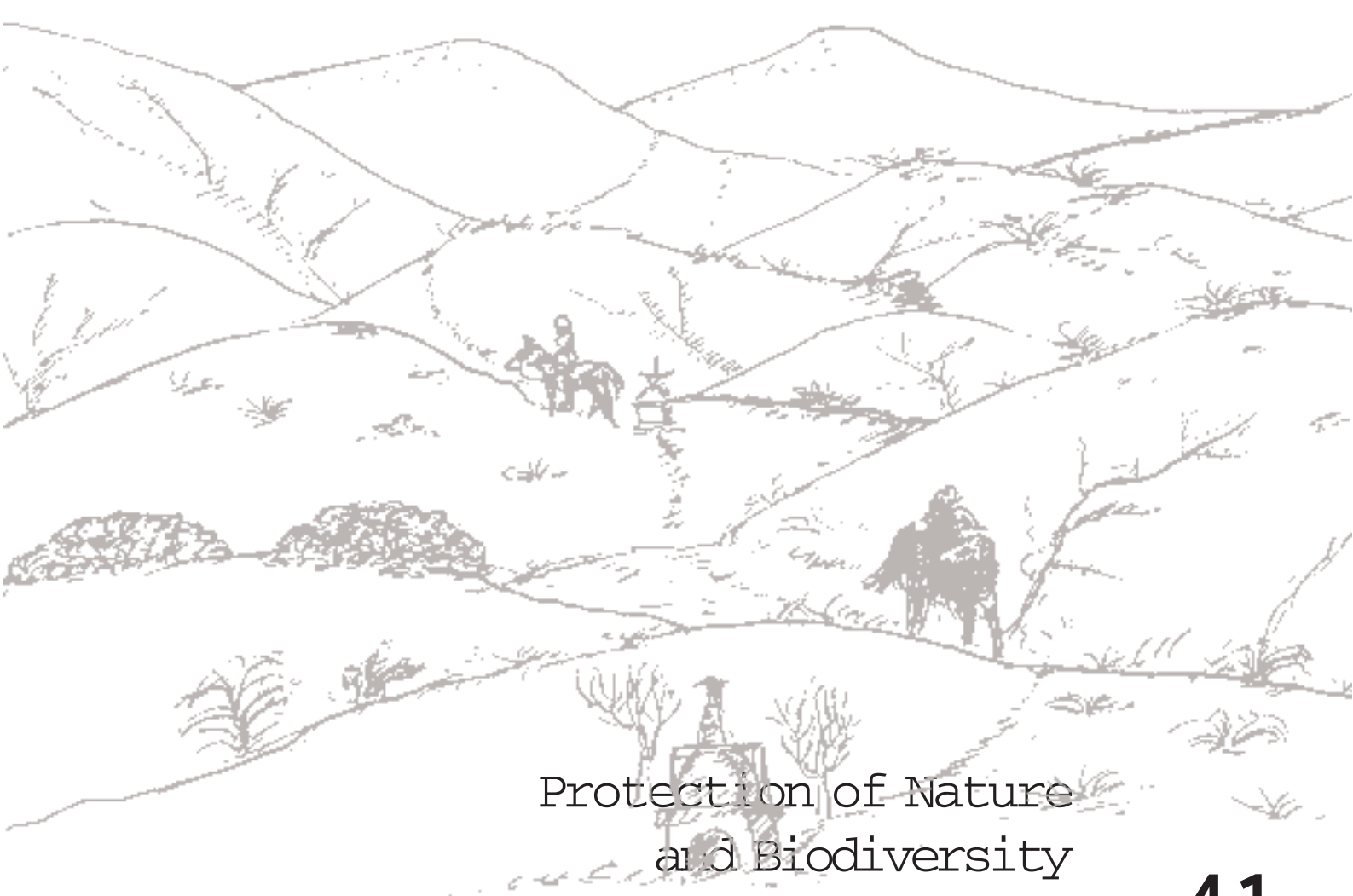
Sustainable land management; as a principle of well-defined practices focussing on productivity, security, viability, protection, and acceptability; needs to be promoted in the region. The roles of different stakeholders need to be properly understood and identified. A decentralized approach is a necessary precondition for successful implementation of sustainable land management. Ecological soundness, economic viability, social acceptability, and political support need to be integrated to find sustainable solutions.

### **Adequate Funding**

Because of the many challenges in the management of land resources in the region, adequate funding is a crucial prerequisite to adopting sustainable land management practices. The economic

crisis in the region makes it very important that outside support is available to

organize and undertake the different measures needed.



## Protection of Nature and Biodiversity

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### **Chaired by:**

Stephen Dompke, People and Nature,  
Germany

### **Introduction**

People have an enormous impact on their environment and, although nature is very tolerant, the results are often negative. Such impacts can be direct; through over-exploitation of natural resources by agriculturists, pastoralists, and hunters; or indirect when, for instance, the climate is changed by desertification or when the numbers of wildlife are dwindling due to the loss of habitats.

In all cases impacts are serious because the livelihood of future generations is dependant on the well-being of natural resources. The natural ecosystems in Central Asia are not stable because of the extreme climatic conditions, but they are ecologically unique. Rich wildlife resources include rare species, of which some are endangered.

In the Wakhan/Pamir area, for instance, one still finds species of ibex, urial, Marco Polo sheep, snow leopard, and brown bear, but all face extinction under current conditions.

In many isolated areas, there is peace but there is also abject poverty and lack of schooling (no funds to pay the teachers) and health facilities (no health clinic is functioning here). The only economic activities are very primitive livestock husbandry and traditional agriculture. Under these conditions, the local people try to improve their living standards by hunting game, as long as there is a market for it. The conservation of natural resources for the future is not a high priority for people at present.

One special aspect is the possible change in climate as a result of the negative impact of the degradation of the environment. In this respect, the Glavgidromet organization in Uzbekistan is studying the 'aerosol impact' (of solid particles

such as dust in the atmosphere) on the climatic system. This 'dust' has arrived in the atmosphere through sand/dust storms and its intensity has increased together with desertification in the region. As was the case with the volcanic eruption of Krakatoa in Indonesia in 1883, when the volcanic ashes thrown into the atmosphere affected the global climate for about one year, one can imagine that a similar effect will take place here with increasing desertification. A climatic change in its turn will bring about changes in agricultural production and in the availability of water resources (for instance less melting away of snow/ice in the mountain ranges).

A recent study by the 'National Agency for Meteorology and Environmental Monitoring' in Mongolia shows that these countries are undergoing a change in climate. Average temperatures have increased in winter and have decreased in summer (-0.8°C to -0.7°C), while, apart from the Gobi and desert areas, precipitation increases of 28 to 46 per cent have been observed during the growing season in June and July. Probably this will have, at least partly, to do with the above-mentioned aerosol impact on the climate. Adaptation measures should be developed for the potential negative impacts of such climate changes.

There is a wide variety of organizations/foundations created for and studies being carried out on the environment.

Several activities in the field of environment and eco-tourism are underway. Any action should have the support of the local community and this means that people need to be aware about the importance of environmental protection. Making laws or plans will not have the anticipated impact without the support of the people, as government control in isolated areas is almost impossible.

Bringing about environmental awareness amongst all strata of society is a

long-term activity. It may take a generation, so it is of utmost importance to start from primary school.

The current period of economic crisis actually distracts attention from environmental problems. The huge waste brought about through the irrational use of natural resources remains unrecognised. It is essential for ecological NGOs to recognise their role and significance in the process of environmental protection and to take appropriate action. The problems involved can often best be tackled for a well-defined territory; and this often requires an inter-regional approach.

It is proposed to establish a protected nature reserve along the borders of the Central Asian states. This will be positive for both the protection of wildlife and the environment. It will help achieve demilitarisation and a consequent reduction in defence expenditure. Maintaining a park is cheaper than maintaining an army in high altitude mountain areas, while the effect on peace-keeping might be the same or even better.

### **Major Issues and Experiences**

#### **BIOSPHERE RESERVES IN CENTRAL ASIA**

**Stephen Dompke**

*People and Nature*

*Germany*

There have been various initiatives on the development of biosphere reserves in the Central Asian countries. The present principles underlying biosphere reserves include (a) a core zone surrounded by (ii) a buffer zone and surrounding this (iii) is the transition zone. The transition zone is the area for sustainable development. Different use intensities are reflected in the various zones and involve very large areas.

In 1996 a conference was held on the establishment of biosphere reserves and a resolution proposed to establish 16 reserves in different Central Asian coun-

tries. All of these are in various stages of planning. In all the proposals, agricultural and grazing areas are included. One proposal is for a former nuclear test site which is now abandoned. The objective is to promote these as unified economic and cultural areas. In some countries, the focus is on preservation of the traditional way of life. Land use zoning, reflecting various stages of intensification, has been a major issue. Efforts are also underway to develop tri-national biosphere reserves involving certain countries. It was also pointed out that more action was needed to push through planned biosphere reserves, establish new ones, and promote transboundary cooperation in the establishment and management of biosphere reserves in Central Asia.

**ENVIRONMENTAL CHALLENGES FOR  
CENTRAL ASIA**  
**Prof. Hirono**

*Seikei University, Japan*

Three issues are introduced: first, globalisation and its impact on sustainable development, second the environmental deterioration we see in Central Asia, and third, the role of the international community.

The financial crisis that was seen in some Asian countries is a reflection of the globalisation process that has both negative and positive aspects. If it has promoted efficient resource allocation, income growth, and increase in employment, it has also had substantial adverse impacts on the environment. Economic development should be consistent with both social justice and a healthy environment.

Looking at the Central Asian Countries, the recent Human Development Report for 1998 shows the environmental profile in these countries to be quite alarming. Many of the indicators, such as CO<sub>2</sub> emissions, are as high as in the developed countries and indicate the extent

to which the environment has suffered during the past decades. The pivotal role has been played by man-made factors rather than natural ones.

The same report also discussed human development indicators, and it is important to look at both as sustainable development includes both human and environmental aspects. In the transition to market economies, the Central Asian countries have suffered greatly in economic terms in as much as incomes and outputs have actually declined many times. In the process of transition, the economic downturn has been very serious and represents the single biggest challenge for these countries in the short run. There is a need to help these countries to improve their standards of living, so that it does not deteriorate and can provide a reasonable basis for sustainable development.

Insofar as future action is concerned, there are a number of points. The concept of 'ownership' is essential so that countries can identify their vision and retain their identity in the process of globalisation. Continuation of economic and social reforms is essential even if it is painful. The resources allocated to the environment should be increased in order to undertake meaningful investment activities. There should be a continued emphasis on human resource development.

Without strong partnerships it is difficult to move ahead in a sustainable manner. Along with governments, the business, private, and NGO sectors should play a greater role. There is also scope for subregional cooperation, as many environmental and economic issues have transboundary implications. Finally, countries should move towards the concept of a 'global village' in which there is no super power in economic, financial, or military terms. There is cooperation and room for diversity of nations and people. This is different from

globalisation, which is focussed on trade, capital flows, and investments. While globalisation is going on and will continue, in spite of all the financial turmoil seen recently in different parts of the globe, there is a need to promote the concept of a global village.

The international community has a key role to play in moving from lip service to concrete action by providing Overseas' Development Assistance/aid (ODA) that is more based on the recipient's needs and priorities and less on donor priorities. The private sector needs to be more involved and there is a key role here for the new multinationals from Asia. In conclusion it should be emphasised that investment in the environment is also investment in human and institutional capital for the future. Environmental investment should not be seen as consumption; a common mistake. It is an investment in the future.

**THE PROBLEM OF LAND TENURE IN MONGOLIA**  
**Dr. Z. Batjargal**

*National Agency for Meteorology, Hydrology, and Environmental Monitoring of Mongolia*

Land tenure in Mongolia is of three types: namely, land use, land possession, and land ownership. Land use is the most restrictive form, permitting only the use of a particular piece of land. Possession is distinguished from land use by the associated contract and by the rights of transfer to another person for use and by the right of inheritance. It is intended that land ownership, in addition to those, will grant the owner the right to dispose of the land including the rights to sell, bequeath, and mortgage.

According to the Constitution, all natural resources, including land, in Mongolia are common property under state protection. This implies that it is not unrestricted common property. The gov-

ernment, as the nominal owner of land, has an undoubted right to lay down rules for its use.

Classical examples of restricted common property are the special protected areas, (Strictly Protected Areas, National Conservation Parks, Natural Reserves, and Monuments) with several zones with varying levels of protection. The total protected area for all four categories by mid-1998 was 18.2 million hectares or roughly 11.6 per cent of Mongolian territory. Pastures in Mongolia are the best example of common property.

Privatisation of land ownership has certain problems.

- ▶ Although the land owner might be interested in its sustainable use without overuse, the land's limited capacity and the scarcity of land for alternative use may lead to unavoidable deterioration. It should be noted that, in Mongolia, many cases of market distortion and misuse of the market economy have led to land degradation.
- ▶ It could lead to the polarisation of society, increasing the differences between rich and poor. Through private land ownership, a few people could accumulate a lot of capital, and the number of poor who do not own any property would grow. Because there is no limitation on livestock in Mongolia for families or individuals, the common property right to pasture cannot ensure the declared rights of citizens to have equality in access to land. According to the Law on Land Fees, which became effective on July 1, 1997, every herding family is exempt from pasture use fees, regardless of the numbers of livestock. This means that a significant proportion of pasture land would, indirectly through their livestock holdings, be owned by a few people, while the majority of local people will have less opportunity to increase their livestock

holdings due to the limited carrying capacity of the pasture.

- ▶ Limitation of one individual's rights by another's is clear in the case of land. One option that can be considered is the transfer of rights to possess land but not the transfer of land to private ownership. In this regard, the few provisions on land ownership are intended to anticipate the eventual privatisation of land in Mongolia.
- ▶ The Constitution stipulates that pastures can not be owned since they are used seasonally and alternately. The winter and spring grazing of livestock cannot be separated from their pastures. Therefore, livestock breeders cannot own land. However, settled people, mainly city dwellers, would have the right to own land.

As the Constitution stipulates, only the citizens of Mongolia have the right to own private land. However, citizenship is also a relative matter and foreign citizens and persons without citizenship who are married to Mongolian citizens could become land owners in the economic sense, even without legal entitlement. There is a probability that foreigners could take over the most fertile lands and lands with better locations.

Would organizations have land ownership rights? There is a debate about whether NGOs and religious organizations, such as temples, should have the right to land ownership. It is an important issue that affects the relationship between the State and religion.

A master plan for land management should be worked out by the state concerning the regulation of the land as well as to clarify the definition of terms within the framework of the Constitution. If the State were to distribute the land among its citizens and hold them responsible for their land, then the citizens should know the quality of the land they are receiving, and the State should know how the quality of the land is changing over time.

At present, there is a strong feeling in Mongolia that for just solutions there should be state involvement. Because of this, there is a clause in many laws providing for state involvement. As laws are implemented mostly by administrators, it is not difficult to see why the views of some administrators dominate, often leading to negative outcomes. The above-mentioned difficulties indicate that land privatisation in Mongolia requires a certain period of time. A step-by-step solution could be the right way to accumulate experience in dealing with land tenure. It is also important to educate people about private ownership and self-reliance.

**LAND RESOURCES IN THE  
ALTAI REPUBLIC**  
**Dr. Vasily Karmanchinovich  
Manyshev**

*Minister of Environment,  
Altai Republic, Russia*

Polluting and destroying nature, we bring harm not only to ourselves but also to future generations. We therefore have a moral responsibility to sustain our peoples and to protect the diversity and wealth of our natural world. Ecological problems are serious in the Altai Republic; but it appears to have been somewhat protected from the impacts of a modern society.

Geographically speaking, the Altai Republic is located in the central part of the Eurasian continent on the boundary of the Altai Mountains and serves as the mountain divide for many watersheds. The Altai Mountains are a unique natural monument, unprecedented in beauty and diversity. They form a natural reserve of rare and endemic species of animals and plants, a centre for especially valuable wild species of medicinal plants. Around 50 per cent of the territory is covered by forests.



The river network includes over twenty thousand large and small rivers with a total length of over 62,000 kilometres. There are over two thousand lakes with a total area of 600sq.km. Altai's minerals have remained unexploited for the most part. There are large deposits of useful minerals — including rare metals.

Regarding biodiversity, the Altai Mountains have 2,200 species of plants of which 300 have some medicinal or food value. There are 62 species of mammal, 290 bird species, over 30 fish species, and over 15,000 species of invertebrate. Many species are rare or endemic, are included in the Russian and Soviet Red Books, and are protected by international organizations.

As with the many mountain peoples of our planet, the Altai native peoples confer a metaphysical meaning on certain territories and sites. These sites are respected and are used ceremonially. An aura of spirituality surrounds many sites in the mountains; viz., cliffs, caves, peaks, springs, and certain plants and animals.

The Altai people are aware that they are caretakers for future generations. There is a legislative and normative base for the complex regulations protecting nature and natural resource use. The Republic has adopted close to 10 laws and over 30 decrees on the environment.

Considering the richness of biodiversity, the aesthetic, spiritual, cultural, and historical values of our land, over 22 per cent of our territory is set aside for protection. Therefore, an important aspect of our strategy for sustainable development is the establishment of a network of protected areas. An Altai-Sayan Mountain Agreement has been signed between eight administrative regions of Russia and the State Committee on Environmental Protection. The Agreement concerns the sustainable use, production, and protection of natural resources,

as well as public health, in the Altai-Sayan region. These two agreements are now being used to create a federal-level programme and laws. A Council has been formed to implement the Mountain Agreement.

The Altai Republic has held many symposiums and meetings on the protection of nature in the Altai-Sayan Mountain Region. Today, the geographical location of the Altai Mountain system, its biodiversity, and its unique nature dictate the need to establish an international nature reserve on the borders of Russia, Mongolia, China, and Kazakhstan.

The Altai Republic side of this international nature reserve is characterised by unique geological formations and landscapes, a wealth of historical-cultural heritage of world importance, and rich biodiversity. The area is well endowed with rare or endemic species such as Argali mountain sheep, snow leopards, and unusual bird and plant species.

The international nature reserve would also provide opportunities for cooperation in joint scientific expeditions for the protection of typical and rare ecosystems, monitoring and research on the influence of anthropogenic factors, resolution of economic problems, and increasing local environmental awareness through environmental education.

The Altai Republic forms a singular historical-cultural area in Central Asia together with Western Mongolia and Xinjiang Province. During the paleometal epoch (the third millenium before the New Era) the Afanasyev culture thrived in these areas. Recent archaeological findings in the Ukok Plateau have indicated that Altai's greatest ancient culture, the Pazyruk, emerged from an area that is now part of modern-day Northwestern China. Common ethnocultural characteristics are also observed in the epochs of the Great Migration and the early middle ages.

Therefore, one important direction for our work would not only be joint research into the ancient past, but also taking action to protect and restore the more visible objects of natural history in the Altai region. Such action could be discussed in the course of joint archaeological expeditions, or at special conferences and symposiums.

**NGOs AS A FORCE IN THE SPIRITUAL-  
ECOLOGICAL TRANSFORMATION**

**IN THE ALTAI**

**Dr. Mikhail Shishin**

*President, Fund for 21st Century Altai,  
Russia*

NGOs are capable of taking on serious environmental problems and play a significant role in transforming and raising awareness among the Central Asian people, strengthening spiritual-ecological values that are a necessary precondition for preserving biodiversity.

The 'Fund for 21st Century Altai,' can serve as a model for other NGOs. (In Siberia and throughout Russia, NGOs are playing an increasing role in environmental protection.) This organization was formed in 1988 after a massive protest against construction of the Katun Dam and nuclear testing at the Semipalatinsk Test Site. At first this was an informal group of activists. Six years ago, a TV-radio station, Katun, was opened in order to air independent programmes on environment and culture. Three years ago, with support from such organizations as the Pacific Environment and Resource Centre and others, a Geographic Information Systems' centre was established. Currently it has GIS technicians who have undergone training in the US. The organization employs environmental activists, journalists, and GIS specialists to work on the environment; and they organize public awareness and scientific activities.

The first advantage of NGOs is that they detect environmental problems as they arise. People become involved in NGOs because of personal conviction. They have a heightened sense of responsibility for the earth, for our future. Consequently, they tend to react to environmental problems more quickly and define those problems more clearly. Aside from that, NGOs consist of people from different social and age groups, and thus they perform a sort of social monitoring, detecting which environmental problems concern people the most. Government agencies and scientific institutions should pay close attention to NGOs' opinions and find means of cooperating with them.

One illustration based on experience is the NGOs' work to fight the environmental impacts of space launching activities in Altai. After space rockets are launched from Baikonur launching pad in Kazakhstan, the space boosters separate from the rockets in mid-air. Different parts of the boosters fall back on to the land in Kazakhstan, the Altai, and Yakutia. According to specialists, over 1,000 tonnes of 'space junk' can be found on the border of the Altai, Khakasia, and Tuva Republics alone. The fallen rocket parts cause mechanical pollution of the area, sometimes cause fires, and often contain left-over rocket fuel. The Altai Nature Reserve is one of the main areas into which rocket parts have fallen. Local residents are protesting against this. Scientific expeditions to the area discovered large fragments of rocket and consider the situation to be very dangerous. TV-Radio Katun was the first to raise this question in the press.

While CoDoCA develops its strategy for sustainable development in Central Asia, it is critical that the question of rocket pollution be raised, since launching pads are causing similar problems in Kazakhstan, China, and India. This would raise the rocket pollution question in the international forum. In short, the demands include the conducting of

environmental impact assessments for any space launching activity. Secondly, the 'dumping sites' must be restored and local residents must receive compensation for environmental damage. As a result of the NGO awareness campaign on this issue, a grass roots' movement has forced the authorities to conduct initial scientific studies, and there has also been some federal compensation for one district affected by fallen rocket parts. Considering all the future launch activities of the US, France, and many other countries, space activities must be placed under international control and, as a first step, a quota must be set to limit launches worldwide.

A second function of NGOs in biodiversity protection is advocacy. Consider how different types of people have varying attitudes towards protected areas: scientists study them; government officials either help or hinder them; business people dream about obtaining access to their natural resources; and the local population often does not understand the role of protected territories and therefore relates to them either indifferently or negatively. In the NGO movement, there is a philosophy on protected areas, and it holds that nature reserves are cathedrals to nature: nature unites humanity. The traditional world view of the native peoples within the Central Asian region perceives nature as sacred. In the Altai Mountains, this was reflected in a taboo against disturbing the peace of certain mountains, rivers, and valleys. These sacred places are essentially 'people's nature reserves'. NGOs use these two concepts to encourage local people and government officials to understand the meaning and importance of nature reserves.

As an illustration of the NGO role in advocating biodiversity, promoting the inclusion of Altai in the list of World Heritage Sites is noteworthy. In Russia this process is only beginning, and thus far three natural World Heritage Sites (Komi,

Lake Baikal, and Kamchatka) have been included in the list. It is important to note that most of the documents prepared, all of the organization, and most of the financial burden for creating World Heritage Sites have been undertaken by an NGO, Greenpeace Russia. The Altai nomination was additionally organized by this NGO and others. At the end of November, in Kyoto, a commission will consider nominations, and it is hoped that Altai will become Russia's fourth World Heritage Site.

The third function of NGOs is uniting people from various walks of life. NGOs, for instance, ensure that science is used to support protected areas and biodiversity protection programmes. NGOs have the advantage of working quickly as they do not require long and drawn-out agreement processes and scientific sessions. As an example, exactly one year ago, in Hovd (Mongolia), NGO representatives proposed the creation of a Central Asian International Nature Monument (a network of protected areas) on the borders of Mongolia, Russia, Kazakhstan, and China. Work on this project has already begun on a GIS system and a concept has been developed through which the World Heritage Sites will serve as the core for the Nature Monument.

**PROTECTION OF WILD CAMELS IN  
CENTRAL ASIA**  
**John Hare**

*The Wild Camel Protection Foundation*  
UK

Protected areas for the wild camel are situated in four areas in Mongolia and three in Xinjiang Province in China. There are about 530 wild camels in China and another 350 in Mongolia. Unlike the 'Prezewalski' or wild horses, which are found in many zoos across the world, there are only about nine wild camels in zoos throughout the world.

The first CoDoCA Conference in 1994 was instrumental in instigating protection activities. Following the presentation of my paper on the situation of the wild camel in Mongolia, I was invited by Prof. Yuan Guo Ying to visit China. Following this meeting, three expeditions were organized in 1995, 1996, and 1997 with support from Xinjiang Environmental Protection Bureau, Chinese Environmental Protection Agency, UNEP, and SHELL China. The visits have been into the Gashun Gobi area over the Tien Shan mountains near the Lop Nur Area. Surveys have also been undertaken of the Kun Tark Sand dunes and the Tarim River Basin. Wild camels in the Gash Gobi area are the most significant because these camels have no contacts with domestic camels. They have been completely cut off from man's activities and from domestic camels and are therefore considered to be among the purest camels that remain.

In 1996 the Chinese Government agreed to establish a sanctuary in the Lop Nur Area. The Lop Nur Sanctuary is huge, with an area of about 107,000sq.km. The objective was not only to protect the camel but also to preserve the desert ecosystem. This area, which was formerly a nuclear testing ground, has now been converted into a nature sanctuary. However, the camel is still under threat from hunting, illegal mining, uncoordinated geological surveys, and uncoordinated tourism.

It is extremely important to protect this endangered animal for a number of reasons. First, it is well adapted to drinking salt water and the other camels would not drink it when they were taken to the area during the expedition. This is of great scientific interest. Second, the camel has survived over 45 overhead atmospheric nuclear tests and is still breeding naturally. Thirdly, all genetic samples of skin and bones sent to the Bronx Zoo in New York have shown distinct genetic differences between this

camel and the domestic camel. This strongly supports the position that these are survivors of wild camels and not past runaways of domestic camels from the Silk Road.

With the cooperation of Prof. Yuan, the Wild Camel Protection Foundation in the UK is also raising funds for the Sanctuary. The agreement with the Chinese authorities is that they meet the running costs, while the capital costs will be provided from other sources. Some funds have been raised, and these are being used to establish checkpoints and telecommunications between these points. There is still a long way to go before the end of this present plan in the next two years. Another important problem is that of the 300 wild camels in the Great Gobi Reserve in Mongolia. These migrate regularly into China's Gansu Province and come outside the sanctuary where they face great danger. It is important that cooperation between the two countries is established soon to protect these animals.

**THE LOP NUR NATURE SANCTUARY**  
**John Hare and Dr. Yuan Guo Ying**  
*International Wild Camel Foundation*  
*UK and China*

China, rich in biological diversity, contains about ten per cent of the world's plants, mammals, birds, reptiles, and amphibians. However, over the past few decades increasing population pressures and development activities have eroded China's biodiversity resources. The Chinese Academy of Sciences (CAS) reports that about 200 plant species are believed to have become extinct and an estimated 5,000 species endangered in recent years due to human activities.

As in many other countries, biodiversity protection in China has focussed on the establishment of nature reserves. There has been a dramatic expansion of protected areas over the past few years, and

more than 700 nature reserves are now established, with a total area of approximately 56 million hectares covering some 5.5 per cent of the country.

The Wild Camel Protection Foundation is striving to establish the Lop Nur Nature Sanctuary to ensure protection for a highly endangered species, in particular the wild Bactrian camel; to protect unique desert ecosystems and landforms in the Lop Nur area; to train personnel in desert biodiversity conservation management; and to integrate local communities' conservation efforts within the proposed Nature Sanctuary through the medium of a comprehensive educational programme.

The establishment of the Xinjiang Lop Nur Nature Sanctuary is considered essential for the protection of the last genetically pure wild Bactrian camel strain, *Camelus bactrianus ferus*, a unique representative of the world's fauna and the only member of the order *Typoloda* existing in a wild state in Asia; the Asiatic wild sheep, *Ovis mammon*, a separate subspecies of the nominal form that is widespread in the desert mountain massifs of Central Asia; and the goitered gazelle, *Gazelle subgutturosa*. In addition, the Sanctuary would preserve the unique wind erosion landforms and fragile desert ecosystems in the area.

The Lop Nur region is located in the south-east of Xinjiang Province, east of the Tarim River basin. The dried-up lake bed of Lop Nur is in the centre of the region, and it is surrounded by the Gashun Gobi desert to the north, east, and west and by the Aqike Valley and the Kum Tagh sand dunes to the south. The Kuruk Tagh Mountains, an extension of the Tien Shan mountain range, dissect the area north of Lop Nur. The area of distribution of the wild Bactrian camel in the Lop Nur region is the only remaining area in the world where the wild camel can be considered to be genetically pure, as it is isolated

from domestic stock. The camel numbers in this area are estimated to be not more than 120. The illegal mining activity in the area to the west of Dun Huang has increased considerably since the 1995 survey. Evidence was found of four new gold mines. At one iron ore mine further north, miners had been constructing home-made land mines to obtain camel meat by blowing up camels that approached water sources.

There are only about five entry points into the Gashun Gobi. The desert environment is so harsh that it is unlikely that entry would be made from other points. It is proposed that five, 200sq. metre checkpoints constructed of brick and cement be erected at appropriate sites at the entry points to the villages of Tuopexun, Tikar, Nanhu, Yamansu, and Houkeng. All the relevant local authorities have agreed to their construction. Each checkpoint will be manned by two staff and two drivers and their remuneration paid from NEPA funding. Each checkpoint will be responsible for their own sub-division of the Sanctuary. They will prevent the entry of illegal hunters and, if necessary, conduct searches of vehicles. They will also ensure that illegal miners do not enter the Sanctuary and that miners from legally established mines on the fringe of the Sanctuary also do not enter their division. They will report on camel sightings within their division and provide much needed information on wild camel breeding patterns. They will demarcate tracks to be followed within their respective divisions and ensure that vehicles do not make unauthorised journeys off these tracks and thereby disturb the highly sensitive and easily frightened camels.

The vast distances encompassed by the proposed Sanctuary make radio communications between the checkpoints and headquarters essential. Many people have disappeared in the desert over the years through lack of communication with the outside.

The wild Bactrian camel is a very interesting subject for scientific research. It has adapted to drinking salt water and has also demonstrated the ability to survive in an extremely hostile environment.

To the north-east of the proposed reserve, along the international border with Mongolia, the wild camel migrates from a sanctuary within Mongolia into an unprotected area in Gansu Province, China. There is an urgent need for inter-country border talks and cooperation to try to ensure that the wild camel is not harmed during these frequent movements into China.

The production of leaflets, posters, radio and TV spots, scripts, and audiovisual materials is considered essential to the success of the Sanctuary. Disaffected hunters and miners have to be informed about the underlying reasons for its establishment. The local community's cooperation and goodwill is considered essential to the long-term survival of the wild Bactrian camel and other threatened species such as the goitered gazelle. Local people who live on the fringe of the Gashun Gobi will therefore be targeted in a comprehensive education programme, and an agreement to do this and to provide suitable back-up support has been forthcoming from the relevant local authorities and the Provincial Authority of Xinjiang Province.

**COMMUNITY-BASED NATURAL RESOURCE  
MANAGEMENT IN AFGHANISTAN**  
**Dr. Ghulam Mohd Malikyar**

*'Save' (Society for Afghanistan Volunteer  
Environmentalists), Afghanistan*

Situated in the heart of Central Asia, Afghanistan is a landlocked country of 652,000sq.km. sharing borders with Iran; the Central Asian republics of Turkmenistan, Uzbekistan, and Tadjikistan; China; and Pakistan. The geographical features of the country, in-

cluding its land locked nature, mountain terrain, large desert areas, limited cultivated land, and scattered resources and often isolated human settlements — render economic development costly and difficult.

The Afghan Pamir in the Wakhan Corridor is located in the Wakhan district in the north-eastern province of Badakhshahn. There are several glaciated peaks that rise over 6,000m. Most parts are an extension of the Hindu Kush Mountains.

The Society for Afghanistan Volunteer Environmentalists (SAVE) has developed and implemented a WWF-sponsored, community-based conservation management programme. SAVE is the only independent environmental agency functioning in the country.

SAVE has introduced the idea that sustainable resource management is for the prosperity of present and future generations. SAVE has opened a site office and is working with people.

Awareness about the significance of wildlife was generated by distribution of leaflets when people were attending mosques, other places of worship, and schools. People have begun to take an interest and participate in the programme. Information about the environment and natural resources has been given to school children because they are the future leaders of society.

The people have participated by hosting the conservation and education teams. They have provided them with food and shelter, rides, guides, and information. They have pinpointed the problems and also the solutions, and these will be incorporated in our present and future programmes. For the first time rules and regulations have been established. People feel that they have some responsibility towards the resources around them.

Some people now think that the natural resources, including wildlife, are finite and need to be closely protected and preserved. Hunting pressure was reduced by a considerable degree. SAVE has facilitated eco-tourism through adoption of regulated hunting using international organizations that will assist in attracting hunters who can pay considerable amounts of money for a restricted hunting license. The money charged for hunting permitted species will go towards the general well-being of the people. Environmental education will go hand in hand with formal education. The problem of education in the area was discussed with interested parties. SAVE is facilitating the submission of proposals to selected organizations.

People are the real actors in any initiative. Their welfare should be at the top of the agenda. People's awareness plays a key role. No conservation activity can succeed unless its social virtues and economic aspects are adequately explored. Through proper use of indigenous resources, a sustainable future can be built for every community.

Rapid population growth has exerted enormous pressure on the natural resource bases in central Asia. The increase population has led to overcrowding not only in the villages but within each household as well. The burden on civic amenities has led to overuse and epidemics of various diseases.

Energy is a dominant factor in deforestation. In the absence of energy-efficient technologies or other fuels, the people use local resources such as wood, shrubs, grasses, crop residues, and animal dung. The growth in demand for domestic energy has a negative impact on land use. These factors force the population to seek cheaper alternatives and over use the natural resource for which they have user rights.

## CONSERVATION OF WILDLIFE RESOURCES

**Yan-ling Song**

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Biodiversity is recognised as a critical component in medicine, agriculture, forestry, and fisheries, with a key role in understanding and conserving the earth's life-support system and in improving the quality of people's lives.

Wildlife is the most important component of biodiversity and, as a natural resource, it has been used widely since human beings appeared on earth. Wildlife species provide an array of essential services to human beings: food, clothes, medicine, raw materials for industry, and so on. The profits to the medical industry from wildlife were estimated at over 10 million US dollars a year in China.

Although more and more nations and people understand that biodiversity is the basis for sustainable development, the conflict between natural resource conservation and immediate survival or development needs exists worldwide, especially in the fragile regions where economic development is badly needed to raise the standards of living. More pressure is being placed on wildlife species that have economic value than ever before. This is a big challenge. More attention should be given to protection of endangered and endemic species of mammals, birds, reptiles, and amphibians.

Some important points for China are as follow.

- ▶ The vertebrate fauna of China are unique and valuable. There are 667 species that are either endemic or which are mainly distributed in China.
- ▶ Vertebrate fauna are facing great loss of habitat and over use. Three hundred and four-eight vertebrate species are threatened with extinction.

- Among these, 141 species can be found in the western region of China.
- ▶ Great progress on biodiversity conservation and sustainable development has taken place in China. Conservation of some flag species has been successful. Budgets for research projects related to biodiversity conservation and sustainable development have increased in recent years, although less than the requirements.
  - ▶ The problem in vertebrate species' conservation is the limited budget. This results in shortage of knowledgeable people as researchers and managers and makes law enforcement very difficult.
  - ▶ International cooperation to develop substitute products for wildlife species should be encouraged. Transboundary cooperation in controlling poaching of the Tibetan antelope should be considered as the first priority in the western region of China.

**SEABUCKTHORN – A PROMISING PLANT TO IMPROVE THE CARRYING CAPACITY OF GRAZING RESOURCES AND FACILITATE SOCIOECONOMIC UPLIFTMENT OF FARMING COMMUNITIES IN THE NORTHERN AREAS OF PAKISTAN**

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In Pakistan, out of the total land-use area of 79.6 million ha, hardly 25 per cent is under cultivation. Livestock grazing still constitutes the most extensive land use in the country. However, the area reported to be under rangelands is 61 million hectares. The rangelands of Pakistan extend from alpine pastures in the north to the arid and desert areas in the south and are used predominantly for livestock grazing. They yield not only forage but also produce fuel, building materials, and medicinal and food plants. According to the Forestry Sector

Master Plan, 86 per cent of the range area in the country is in poor condition and is degraded. It was estimated that, with the level of livestock population in 1986, the rangelands of the country were stocked with twice the number of animals that they could support.

Seabuckthorn, a native plant species of the northern mountains of Pakistan will join the list of multipurpose plant species, because it will play a very special role in future. This plant can thrive on hungry, alkaline-saline soils. It has a highly developed root system and therefore presents an excellent biotic choice for holding the soil on fragile slopes. It also has an outstanding ability to take root even in poor soils, because of its ability to fix nitrogen directly from the air through the nodules in its roots. It is estimated that about 180kg of n/hectare/annum can be fixed in the soil around seabuckthorn forests. Seabuckthorn has a great potential for conserving soil and water by reducing runoff (i.e., >95) thereby reducing soil erosion (i.e., 99%). There is also an extraordinary economic aspect to seabuckthorn. A natural seabuckthorn forest can yield 750 to 1,500kg of berries per hectare. Its small orange coloured fruit is a storehouse of vitamins and important bioactive substances. The vitamin C content is five to 100 times greater than any other fruit or vegetable known. Its pulp and seed contain high quality oil which is important for its medical value. In addition, the seabuckthorn plant is a good source of firewood and forage for livestock. Moreover, it has a wide adaptability and can be grown in cold and arid areas having harsh climatic conditions and poor soil where many other species can not grow well.

It is possible to grow Seabuckthorn throughout the Hindu Kush-Himalayan (HKH) region. The National Arid Land Development and Research Institute (NADRI), the Forest Department, Water and Power Development Authority



(WAPDA), and Aga Khan Rural Support Programme (AKRSP) are setting up a series of nurseries in the northern areas of Pakistan for large-scale propagation of seabuckthorn throughout this mountainous belt. The NADRI is also working as a catalyst to convince the AKRSP and Hamdard (indigenous plant-based pharmaceutical) to set up a seabuckthorn-based industry in the northern areas. These efforts will not only increase the carrying capacity of rangelands but will also improve the socioeconomic conditions of resource-poor mountain communities.

### **Conclusions**

The presentation and the discussions that followed emphasised a number of key points.

#### **Current Economic Crises and Protection of Natural Resources**

The region was going through a very serious economic crisis with the expectation that the standards of living of the people would either remain stagnant or even fall. Under such circumstances, people would favour accessing every opportunity to support their present income and consumption levels, even if this meant immediate exploitation of all available resources. Economic hardship was therefore likely to generate further pressures on an already deteriorating resource base and greater efforts were needed at all levels to ensure that the natural resource base did not erode any further, in spite of economic difficulties. ODA has played an important role in this respect.

#### **Balancing State Control/ Management and Private Ownership of Natural Resources**

This was a dilemma before all the Central Asian States, as they were in a pe-

riod of transition from a state-controlled economy to a market-oriented system. All the natural resources were under state control in the past and movement to private ownership of these resources needed careful analysis of potential problems and phase-wise implementation of programmes. Potential problems such as misuse of resources, concentration of ownership, and increased conflicts regarding control over resources, required durable legal and institutional solutions.

#### **Increased Need for Protection and Management**

While there has been a major surge in protection activities in the region, the need was still much greater, both in terms of further strengthening presently protected areas as well as establishing new ones. Numerous threats to protected species still exist from various sources. Better understanding and recognition of the identity of special groups of people and their heritage have expanded the concept of protection of sacred, religious, and historical sites. While countries had agreed to establish various biosphere reserves, the pace of implementation was slow. The role of people's participation was crucial in the sustainability of protected areas.

#### **The Role of NGOs**

Although NGOs were a recent introduction in the area, they had already demonstrated their role in taking initiatives and mobilising popular action for environmental protection. NGOs were seen as an important mechanism for furthering the protection of natural resources in the region. Obviously, NGOs could not do it alone without full support of the government and backing of the people.

# Sustainable Grazing

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**Chaired by:**

Prof. Don Bedunah,  
University of Montana, USA

**Introduction**

In the past, semi-arid Central Asia had a nomadic civilisation with vigorous and well-adapted people who lived in harmony with nature. Livestock migrated over long distances avoiding severe weather or seeking sufficient fodder and water.

Once the Soviet Union was established, at least in the CIS countries, agriculture was concentrated in collective farms. The Soviet policy sought to sedentarise and intensify livestock production with supplies of cultivated fodder and other inputs. On the one hand, the mobility of livestock was reduced and concentrated in limited areas, leading to very intense grazing pressure on rangelands with a low carrying capacity, while, on

the other hand, stall feeding was introduced.

Following visits to the United States in 1955 by senior Soviet policy-makers, where they observed stable-feeding of cattle with irrigated maize grown for the purpose, they copied this approach for the Soviet Union. Intensive irrigation-based livestock production was promoted at the cost of extensive pasturing.

At present, collective farming in the CIS countries is being reorganized and markets are being liberalised. This has changed the economics of livestock production and patterns of rangeland use. The removal of state subsidies on supplies of cattle feed make it necessary for the newly-privatised pastoralists to again practice long-distance migration, as in the past. Another consequence is a huge de-stocking with the inherent benefit of regeneration of some degraded pastures, but the social and economic effects of de-stocking are negative. Maintaining

livestock mobility under market conditions poses new challenges to pastoralists and policy-makers in the region.

As an example, the problems of the Pamir mountain range may be highlighted. Here 70 per cent of pastures are situated at altitudes of 3,500m and above. As a result they experience harsh climatic conditions, such as extreme dryness of the air, a high insolation rate with a high content of ultra-violet light and an enormous variation of temperature over the day. These conditions, combined with heavy anthropogenic pressure, have led to serious degradation of pasture as a result of growing soil erosion, compaction of the soil surface, and, consequently, deterioration in the vegetative cover. It is felt that re-establishment of the original environment is hardly possible.

In Xinjiang, an estimated 80 per cent of the 48 million hectares of pasture is at one stage of degradation or another. As a result, about 1.3 million head of livestock died annually over the period from 1990 to 1995, involving an economic loss of 1.5 billion *yuan* per annum.

It is clear that all measures possible should be taken to re-establish the disturbed, delicate balance between grazing and the carrying capacity of the land. This means, on the one hand, a reduction in the numbers of cattle grazing in the area and, on the other, an improvement in the carrying capacity of the land. There are many good examples of cropping and management practices within the region and greater efforts are needed to share and adapt successful involvement and practices from specific areas.

In the Central Asian region, each of the products, viz., milk, meat, wool, and hides, are very important. It is also efficient to produce these commodities nearer to the consumers who need them. Given the geographic conditions, it

would be wise to specialise, with meat, wool, and hides being obtained from cattle, sheep, and goats grazing on the pasture lands; and milk being produced by irrigation-based livestock production upstream of the Aral Sea basin, near the concentration of people in populous Uzbekistan. Thus fodder crops, such as maize, which are less demanding on the use of water and pesticides, are being tested as an alternative to cotton. Once sufficient milk is produced, dairy industries can also be established.

Overexploitation of grazing areas has to be prevented by reducing the numbers of grazing animals per surface area. Because of the economic situation, considerable de-stocking has already taken place, but more will have to follow if the balance with the environment is to be re-established. Once that is the case, pastures, as long as they have not been affected by erosion, will more or less return to their original condition. Mainly, gully erosion will have to be controlled by damming the gullies so that erosion will not spread any further.

### **Major Issues and Experiences**

#### **IMPORTANCE OF THE MAINTENANCE OF TRADITIONAL LIVESTOCK HERDING CULTURE IN SUSTAINING RANGELAND ECOSYSTEMS IN MONGOLIA**

***Prof. Donald J. Bedunah and Daniel Miller***

*University of Montana, USA, and University of Melbourne, Australia*

For at least 1,500 years and perhaps for 4,000 years, large numbers of livestock and nomadic herders have lived on the rangelands of Mongolia. Mongolia's long history of nomadic pastoralism and the value that Mongolians place on their nomadic heritage certainly imply that herders have a rich store of knowledge about these rangelands and the livestock using these environments. Rangelands'

products continue to be the dominant source of feed for livestock, but these rangelands are also important as watersheds and as a source of medicinal plants and genetic material for future economic use. There is little doubt that the environment is of concern to the Mongolian pastoralist, but the significant changes in the political system during this century have altered grazing practices. Presently, there is justifiable concern that rangeland degradation and loss of wildlife are accelerating as Mongolia proceeds with its economic reform process. Changes associated with the movement of the economy from a command economy to a market economy since 1991 have had a number of significant impacts on livestock herders, including an increase in the number of families with livestock and an increase in the number of 'absentee' livestock owners.

There is also justifiable concern that socio-political changes are increasing poverty and risk to herding families. To maximise sustainable livestock production and to maintain the rich biological diversity of these lands, the best methods of traditional livestock herding systems, including traditional, cultural grazing control practices, reduction of risk, and sharing of labour will need to be closely considered in policies implemented during the economic reform process. Mongolia offers the opportunity to join modern technical knowledge with traditional livestock management, but to do this will require a careful examination of how the economic reforms in Mongolia are impacting semi-nomadic populations.

The main threats to sustainable livestock grazing in the South Gobi, Aimag, identified during fieldwork in 1998 are:

- 1) a significant increase in numbers of herding families since 1992;
- 2) a significant increase in numbers of livestock;

- 3) a lack of markets (or low prices) for some livestock products, especially meat and dairy products;
- 4) a general lack of control of land use by governing agencies and/or herding groups leading to conflicts, especially for winter pastures;
- 5) a lack of cooperation among herders, such as the traditional 'khot-ail', for sharing labour, resources, and controlling grazing use;
- 6) a general lack of recognition of the negative impacts of significant forage competition on the condition of livestock; and
- 7) a loss of 'traditional' nomadic movement resulting in greater competition for forage and greater degradation around these sites.

**MOBILITY AND THE MARKET: ECONOMIC AND ENVIRONMENTAL IMPACT OF PRIVATISATION ON PASTORALISTS IN KAZAKHSTAN**  
**Dr. Carol Kerven and Ilya I. Alimaev**  
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 UK

The paper examines post-independence privatisation of state collective farms as the latest stage in the expansion and contraction of pastoral mobility over several centuries. The seasonal movement of livestock to different natural pastures is predominantly a response to climate and ecology, which in the case of Central Asia has been modified by the degree of dependence on winter fodder and engagement with markets. Availability of feed over the cold winter period sets the limit to carrying capacity in this environment. Feeding cultivated fodder to livestock over the winter is a practice that has varied over the years, according to the demand for surplus livestock products by the market or state. Increased demand accompanied by more winter fodder production led to increases in the livestock population. This relationship can be simply expressed as follows: degree

of mobility is a function of the availability of winter feed and livestock population – reduced mobility is possible when livestock can be stall-fed over the winter. The availability of winter feed is in turn a function of demand for livestock products – it becomes economical to produce more winter feed when there is increased demand for the outputs. There are of course biological and economic thresholds at the upper and lower ends of this relationship. Discovering and sometimes exceeding these thresholds have been the principal experiences of the state's interaction with the pastoral livestock sector.

Shifts in the balance between livestock mobility, winter fodder, and the market have resulted from state policies, beginning with Russian settlement in the 19<sup>th</sup> Century, continuing throughout the Soviet period of collectivisation and up to the present, following institutional and economic reforms made by the new government of Kazakhstan. The carrying capacity of Kazakhstan's pastures has thus been conditional rather than fixed, changing according to the impacts of state policies on livestock management. This remains true for the future, as the effects of the most recent change-decollectivisation – have again altered the dynamics between pasture productivity and livestock populations. Stability in the carrying capacity may not be established in the future and several scenarios are possible. This paper summarises the stages of change, focussing on the impacts of current policies on mobility and livestock density. Several trends and their associated policy options are identified.

The paper concludes the following.

- ▶ Pasture productivity is the result of human management as well as the environment. Management of Kazakhstan's pastures has changed their carrying capacity over time.

- ▶ State livestock collectives have been privatised recently, and this has resulted in major de-stocking, emergence of a few large-scale private livestock farmers, and great difficulties for small-scale livestock keepers. Carrying capacity is now underused in many pasture areas, but may be exceeded in other areas.
- ▶ Kazakhstan's pastures can become more productive again, but a balance is needed between intensive and mobile management methods. Livestock farmers need technical advice and some economic assistance to achieve this balance.

**'BLACK SOIL TYPE' DETERIORATED  
GRASSLAND  
Ma Yu-shou<sup>1</sup>, Lang Bei-ning<sup>2</sup>,  
John Davis<sup>3</sup>, Shi De-jun<sup>4</sup>,  
Wang Qi-Ji<sup>5</sup>**

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The Qinghai-Tibetan Plateau is the main base for animal husbandry in China. The total degraded grassland on the Plateau is 42,510,000ha and is 33 per cent of the total grassland area in the region. Among the degraded grasslands, the 'Black Soil Type' covers about 7,031,900ha and is about 16.54 per cent of the total grassland area in the region. On the 'Black Soil Type', the ratio of forage to toxic plants is 1.73:1 — in the slightly degraded area; 2.46:1 in the medium degraded area; 0.98:1 in the seriously degraded area; and 0.33:1 in the extremely degraded area. The living roots, organic matter, and soil moisture content are decreasing according to the degree of degradation. But the salt content and available nutrient content are higher than the non-degraded areas.

Rodents are a very serious problem. The number of pica burrows is 4,168/ha; active burrows 1.167/ha and 374 pica/ha on an average on the 'Black Soil Type' grassland. According to statistics, the area of 'Black Soil Type' deteriorated grassland in Dari county increased from 167,700ha in 1982 to 575,000ha in 1994. The incremental rate is 14.75 per cent annually, about 45,000ha of grassland deteriorate annually. The increase in 'Black Soil Type' deteriorated grassland has damaged the eco-environment in the riverhead area and hindered the sustained development of animal husbandry. Scientists in the province have carried out many research and rehabilitation activities in Guoluo and Yushu prefectures and have accumulated much experience on setting up sown pasture on the deteriorated area. 'Black Soil Type' deteriorated grassland is caused by over-grazing, rodents' damage, human activities, and a dry climate.

It should be realised that the control and rehabilitation of the black beach are very difficult and require long-term efforts. It is well known that the eco-system of alpine meadows is very fragile; once it is destroyed it is very difficult and takes a long time to regenerate. The rehabilitation of degraded areas will also require the co-operation of many social sectors. The action must be taken under the general arrangement of the government in order to make it good. Research on the rehabilitation of degraded areas should be carried out along with improvement in the germination and seed multiplication of *Kobresia* species. Once *Kobresia* is successfully re-seeded and established, demonstration areas should be set up to determine the proper combination of different species for recovering degraded areas. People living in seriously degraded areas should be re-settled in areas where conditions are better. After removing the people, the area should be fenced off to allow natural rehabilitation. This is a serious decision that needs to be taken by the government.

**GRAZING COMMONS OF THE HINDU  
KUSH-HIMALAYAS AND TIBETAN  
PLATEAU: CONSTRAINT OR  
OPPORTUNITY?  
Camille Richard and  
Daniel Miller**

*ICIMOD, Nepal, and  
University of Melbourne, Australia*

Today's development paradigm often portrays pastoralist strategies involving the use of grazing commons as unsustainable. Despite the extensive documentation of the efficacy of indigenous pastoral systems, negative perceptions pervade pastoral policy and management throughout the developing world.

This paper explores the origins of such negative attitudes, given the historical context of political change and expanding markets in agriculture and commercial forestry. Case studies are derived from two regions of the Hindu-Kush Himalayas (the Tibetan Plateau and the British Punjab of India), different in terms of physical and political environment, but similar in socioeconomic outcomes. In both cases, the displacement of indigenous systems of common property management, specifically of grazing lands, in favour of expanding agricultural, timber, and even livestock market economies, has led to increasing livestock pressure on remaining commons and to the marginalisation of pastoralist cultures. In today's socioeconomic environment, there is a growing trend on the part of Asian governments to promote increased livestock production through privatisation of rangelands without considering the unintended consequences of such actions.

It is argued that common management of rangelands can be a viable alternative to private ownership, especially in areas where, until recently, such resources have been traditionally managed in a communal manner. The challenge for Central Asian policy-makers is to:

- 1) assure secure property rights and tenure;
- 2) develop policies and programmes that support and legitimise local institutions; and
- 3) conduct sound participatory research that helps identify environmental and socioeconomic constraints and opportunities specific to each region in terms of appropriate technologies and markets. This participatory approach would benefit the larger community while still preserving the resource through local community control. Indigenous communal management systems can be adaptable and efficient, if given the flexibility to adjust to changing conditions and given the support and legitimacy by government agencies.

**ENVIRONMENTAL INDICATORS OF  
SUSTAINABLE DEVELOPMENT IN THE  
REGIONS OF KAZAKHSTAN**  
*K. Karibaeva, L. Shabanova, and  
Dr. V. Lysenko*  
*Kazakhstan*

The powerful anthropogenic pressure on the natural complexes of Kazakhstan has resulted in aggravation of the ecological situation in vast territories of the Republic. The accumulation of negative anthropogenic effects is caused by many factors. Among these, selected ones have been highlighted.

- ▶ Certain locations have experienced greater environmental problems than others, and it is necessary to identify the factors behind these variations
- ▶ Direct impact (climate) determining natural factors
- ▶ Re-distributive (relief, soil, etc) differentiation of impacts

All these factors basically cause a feedback reaction of ecological systems to a complex of specific loads, determining the rates and the degree of their trans-

formation, current condition, and development trends.

The negative influence of anthropogenic pressures on the environment is characterised by various degrees of transformation in ecological systems. For their quantitative definition, the principle of integrated estimation of influence on the environment of industrial and agricultural production and the degree of pollution of water reservoirs are applied. As a quantitative parameter, technogenic pressure is a degree of urban construction in administrative areas of Kazakhstan (the ratio of rural and urban population). An agricultural pressure is estimated in the final results of its impact, looking at the share of damaged (deserted) and ploughed areas to the total area of the Republic.

The degree of pollution of water mains was estimated by assessing the ecological situation of the territories. It was assumed that the extent (to which there is a risk in terms of reduction in biodiversity) could be determined by the ratio of the total areas to the area under transformed ecological systems.

Analysis of the data rendered the following information.

- ▶ The Kazakhstan territory, according to the degree of urban development indicator is non-uniform, and this is explained by the degree of socioeconomic differentiation. Urbanisation determines the extent of technological pressure on the environment and, accordingly, the ecological situation in particular territories.
- ▶ The areas of damaged land occupy vast territories within the total area, also indicating the extent to which diversity is at risk in the ecological systems and their components.
- ▶ Water facilities located in a number of areas are differentiated by the degree of pollution and, accordingly, have varying degrees of impact.

In general, for the whole territory of the Republic of Kazakhstan, it is necessary to review the use of nature and to develop measures to conserve biodiversity in correspondence with socioeconomic trends in the development of specific regions.

**CHANGING PROPERTY RIGHTS' SYSTEMS IN WESTERN MONGOLIA**

**Dr. Peter Finke**

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This paper deals with changes in property rights' systems in the context of livestock and pastures in Western Mongolia in the post-socialist period. The aim is not to focus on the contradiction between private herd ownership and communal grazing or on the superiority of private property rights, but rather to look for the criteria essential for an effective property rights' system.

Property rights are defined as formal and informal rules regulating the access to and usage of different kinds of resources. They include not only ownership structures, but also the actual control and rights people have over a specific resource. So, for example, taxes, restrictions on sales, or the danger of appropriation by the state or other actors are all part of a specific property rights' system. Clearly defined property rights are thought to be the main prerequisite for an efficient allocation of resources, and thus the relative success of different economies as well as ecologically well-adapted behaviour, because they result in legal security and offer incentives for investment and long-term strategies. As well as other economic and social institutions, property rights are a product of repeated interaction among self-interested actors. This means that they are constantly under pressure to change to serve the interests of individual actors; and thus they always reflect the power and resource asymmetries inherent in the respective society.

It is argued that one main prerequisite for an effective property rights' system is that it has to be self-organized, i.e., results from bargaining among the affected actors, and is not imposed by a third party such as the state. This enables the emergence of mutual trust and confidence that others will respect the institution and therefore it will pay to respect it as well. This creates legitimacy and credibility, which may be more important for the effectiveness than for criteria of economic efficiency or social justice.

The delegation of the privatisation procedure to the individual collective enabled local power asymmetries to influence the outcome of this bargaining process to a significant extent, as demonstrated above. Nevertheless, the modus was quite successful because it was perceived as a self-organized institutional change and created a great degree of legitimacy and credibility.

Both legitimacy and credibility are lacking from the property rights' regime for pastures. The existing system is not perceived as self-established but as one superimposed by the former socialist organization. At the same time, free-riding increases because of the low time horizons in post-socialist society, especially among former city-dwellers who often move between different districts within the year and are not part of local networks. In addition, the option of emigrating to Kazakhstan may reduce the expected benefits of behaving in accordance with existing rules.

Considering the ethnic heterogeneity and the economic decline faced by many households, it might be necessary to introduce neutral agents to encourage and conduct the search for new and effective informal arrangements. Nevertheless, these have to be based on a self-organized procedure since this seems to be, as argued previously, more important for the effectiveness of an institu-



tion than economic efficiency or social fairness.

**PRIVATISATION AND CHANGES IN  
PASTURE USE IN BETPAK-DALA,  
CENTRAL KAZAKHSTAN**  
**Sarah Robinson**

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The study described in the paper was carried out in 1997 and 1998 in Betpak-dala, an area of steppe covering much of central Kazakhstan. This area includes much of Dzhezkazgan *oblast*<sup>\*</sup>, plus the Northern *rations* of Dzhambyl and Chimkent *oblasts*. The area is home to one of the three populations of saiga antelope in Kazakhstan, and these follow roughly the same migration routes once followed by domestic animals. The object of the study was to examine how land use in the area has changed since the fall of the Soviet Union, and how these changes might affect the pastures and the population of saiga that live on them. The Kazakh steppe is very variable in terms of forage quality, both temporally and spatially. Because of this, traditionally Kazakh pastoralists were very mobile, as this enabled the efficient use of all pastures available at higher stocking densities than would have been possible under a sedentary system (Kerven et al. 1996). Under the Soviets, the migrations were less extensive, but there was a greater provision of winter fodder, enabling high stocking rates. In independent Kazakhstan, stock numbers have dwindled, migration has declined, and unavailability of winter feed has decreased. The effects of these changes and how they have come about during the process of privatisation are examined in the paper.

This study provides a snapshot of the situation on farms in Kazakhstan in 1997/8. The situation is changing very

rapidly, and it is difficult to predict how things will develop. It is unclear whether the southern farms will go the same way as those in the north, as the fact that the collective structure had completely disappeared on the northern farms was due to a decision at the *oblast* level rather than at the farm level.

However, common to all the farms was the fact that most of the wells or springs, especially those far from the centre, were unused, and in general the stock density is well below carrying capacity. The central area of Betpak-dala, which is *gosfund*<sup>\*\*</sup> land, is to all intents and purposes empty. This includes a large part of the saiga's range, including the main birth areas.

On the northern farms, grazing patterns have not changed much since Soviet times, shepherds tend to have received the land they used before 1992. However, there has been a trend to reduce stock movement by swapping land shares for those that are closer together.

Around the population centres stock densities were very high because this land is tax free, and people with less than about 50 sheep tended to graze them on this land — which is visibly in poor condition. Such numbers of sheep are not adequate for long-term family survival, as sheep are not only eaten, but also given away for marriages and as barter goods. On the northern farms, almost every family who did not have a private farm (i.e., who had fewer animals) either ate or sold saiga meat several times a week in order to avoid losing their sheep herds altogether. The increasing poverty of the majority of inhabitants in the region is therefore resulting in under-use of the pasture in most areas, over-use in others, and increased exploitation of saiga herds for meat.

\* *Oblasts* are administrative districts and *rations* are smaller districts within them.

\*\* *Gosfund* land is state-owned land which normally is not part of the territory of any particular *Sovkhoz* (collective farm).

Those who had started private farms seemed to be better off than those who had not, but it is also true that the only farmers interviewed were those who were still farming; many who had started private farms in the early 1990s were no longer working as farmers. Virtually all the shepherds interviewed had been shepherds in the time of the Soviet Union, and many had substantial numbers of stock before privatisation. Even so, many had lost almost all their stock since then.

The main problems with the privatisation process are the inequitable distribution of assets and access to winter feed. These are strongly linked to inequality of access to accurate, unbiased information about privatisation. This information would have enabled people to understand their legal positions with respect to allocation of *sovkhoz*\* assets, thus strengthening their bargaining position.

### **Conclusions**

Pastoralism as seen today in much of Central Asia will most likely vanish, given changing values, attitudes, and external exposure. If it follows the path of other areas, uncontrolled growth and *ad hoc* market forces will also result in rangeland degradation. Livestock are a major income source for Central Asia and policies must be in place that favour their development.

For a sustainable future, the crux of change lies not with the pastoralists, but rather with the people who dictate policy and design programmes. First policy-makers must be committed to decentralized land policy reforms that sustain local institutions and which guarantee that local effort will be met with a sense of pride and ownership. Government

agencies must work with communities to define constraints and opportunities and hence design appropriate programmes that are equitable, that promote self-sufficiency and self-governance, and, therefore, ensure sustainable conservation of the resource.

Seen from a historical perspective resource sustainability and secure tenure and property rights go hand in hand. A country sustained by self-sufficient, self-governing communities (in partnership with their government), is more likely to develop sustainably in today's global economy. Without the freedom, knowledge, and incentive to improve their own lives and seek out alternative forms of livelihood, an equitable inclusion into the global economy is unlikely.

The main issues emerging from the presentation and the discussions are as follows.

- ▶ Changing political systems have altered grazing systems by increasing livestock populations, reducing traditional mobility, altering land tenure rules, encouraging cropping or forestry, and introducing animal fodder. Some of these changes have led to or may increase pasture degradation.
- ▶ Case studies from Mongolia, Kazakhstan, Tibet, and the Punjab showed that grazing patterns had varied effects on social institutions and equity. In some cases new grazing patterns resulted in unequal distribution of key resources (better quality pasture, machinery or water). This resulted in some pastoralists being impoverished while others could accumulate livestock.
- ▶ Stocking rates and the resultant grazing pressure were linked to market demand for livestock and reduction in mobility.
- ▶ Social institutions were crucial in determining access to key resources, as

\* A *sovkhov* is a collective farm in which all workers are employees of the state.

were state-imposed regulations. In some regions, both social and state institutions were breaking down, causing greater pressure on key resources. A balance is needed between local social versus state control mechanisms to ensure sustainable and equitable grazing systems.

Some of the important solutions that were suggested are given below.

- ▶ Promote or retain mobile grazing systems in semi-arid areas and areas of low natural productivity, through exploiting ecological variability temporally and spatially.
- ▶ Promote cost-effective water management and interstate cooperation.
- ▶ Encourage specialised markets for livestock products, in order to raise the income of pastoralists.
- ▶ Assess the various causes of degradation through monitoring the impacts of political changes on grazing systems, in order to identify appropriate policy and technical measures to reduce degradation.
- ▶ Find the best balance between state and local control of key resources in each situation.
- ▶ Increase the carrying capacity of natural pastures through support to livestock farmers that will not be environmentally damaging.
- ▶ A proper legal framework for land ownership adapted to the local landuse patterns and traditions is required.



Gongga mountain is the highest peak of the area of China proper, situated in Great Snow Mountain Ranges of Hungduan region in Western Sichuan High land. It reaches an altitude of 7,556m. The view in front of the Gongga is alpine meadow of Litang plateau, eastern margin of Great Tibetan Plateau  
Photo © Zhang Yongzu, Institute of Geography, Chinese Academy of Science

## Economic Policy and Planning

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### **Chaired by:**

Fu Lai Sheng,  
WWF, USA

### **Introduction**

Planning of sustainable development has gone through many changes over time. In the seventies new projects needed only to be sound technically and feasible economically. Projects were mainly judged on their economic merits. Later social aspects and the environment were taken into account as well. At present, a project has to go through screening, showing that the project is:

- ▶ technically sound,
- ▶ economically feasible,
- ▶ socially desirable, and
- ▶ environmentally justified.

In the countries of the former Soviet Union, the above criteria were not followed much. It was mainly the planned quota that governed all activities. Economic and environmental aspects were

neglected, and there was no integration of ecological goals into economic development. The cost of undertaking activities was not important and, because of these practices, these countries are facing serious environmental problems.

At present, this is changing because donor representatives and NGOs require adherence to technical, economic, social, and environmental considerations while planning projects.

There are many different ideas about 'sustainable development'. Some see the main objective of sustainable development as a growing and stable welfare of the population, others see it as "minimising the environmental harm which may arise from development activities, rehabilitating contaminated lands to beneficial use, alleviating poverty through implementing sustainable industrial and agricultural developments and thereby improving the standards of living of developing communities.

It is also considered as 'building up of self-sustainability in order to ensure national independence'.

In all cases it is clear that a programme of sustainable development cannot be a short-term one, but should be developed for the long-term. Such a programme should give proper consideration to the specific factors of the Central Asian region, including:

- ▶ high annual and diurnal temperature fluctuations,
- ▶ low rainfall density,
- ▶ high evaporation rates,
- ▶ rapid growth in population and unemployment, and
- ▶ changes in markets and the economic system in general (including land reforms).

Considering the divergent ideas and interests concerning proper use of the natural resources amongst the different ethnic groups in the region, sustainable use of resources becomes an even more complicated issue.

The situation is not an easy one on account of the following factors.

- ▶ Improper waste management resulting in pollution
- ▶ Absence of treatment facilities for drinking water
- ▶ Obsolete, inefficient, and polluting industries
- ▶ Intensive use of chemicals in agriculture with an adverse impact on health and productivity and causing irreversible loss of wildlife
- ▶ Salinity, deforestation, climatic changes, soil erosion, wetland destruction, and loss of livelihood as a result of unsustainable use of water and land resources in the basin of the Aral Sea

- ▶ Radiation risks caused by nuclear testing in the Semipalatinsk Nuclear Polygon decades ago
- ▶ A poor health situation, especially for children, caused by a variety of reasons: insufficient and incorrect nutrition, poverty of families, and the increasing prices of and a dilapidated health system

An additional problem mentioned for the coastal areas of the Caspian Sea is the threat of inundation due to the rising water levels.

Notwithstanding, there are also some positive factors that could play an important role in the efforts for sustainable development and these are:

- ▶ a vast reservoir of well-educated people;
- ▶ sufficient supply of professionals, in particular doctors, who are ready to improve their skills;
- ▶ a majority of people own land and domestic animals, and this could help to solve food problems; and
- ▶ a population that is very keen on developing the non-governmental sector.

All authorities involved in planning projects in the region must be made aware that this can only meet with success through a genuine interdisciplinary approach, in which none of the aspects of importance to the region is overlooked. This can be assured by consulting with the communities who will benefit from the projects and by involving them in the actual planning. It should also be said that economic planning should not be carried out only by economists: qualitative considerations, such as social and environmental values that do not always appear in economic analysis, should be included in the planning process.

## **Major Issues and Experiences**

### **TRANSITION TO A MARKET ECONOMY, POVERTY, AND SUSTAINABLE DEVELOP- MENT IN CENTRAL ASIA**

**Prof. Richard Pomfret**

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At the time of the dissolution of the USSR, the Central Asian republics were, together with Azerbaijan, the poorest Soviet republics and the ones with the largest percentage of the population living in poverty. Since becoming independent, Kazakhstan, the Kyrgyz Republic, Tadjikistan, Turkmenistan, and Uzbekistan have followed divergent national development strategies, with the first two moving relatively quickly to reform their economies and the last two adopting explicitly gradual transitional strategies. All five countries suffered declines in output and national expenditure, but there is dispute over the magnitudes.

The Kyrgyz Republic has been the most ambitious of the Central Asian Republics (CARs) in the speed and extent of its transition to a market-oriented economy. This strategy has been associated with a serious decline in living standards and widening of income inequalities. Those most at risk are the rural poor in the south of the country. Uzbekistan, where people are the least educated among the states, has adopted a more gradual transition strategy than the Kyrgyz Republic or Kazakhstan and appears to have experienced lesser decline in living standards than these two. The experiences of Turkmenistan and Tadjikistan are more difficult to interpret in a comparative setting because, for most of the post-independence era, the former has attempted to maintain the economic *status quo*, whereas the latter has been disrupted by armed conflicts: neither of these two had embarked on a sustainable development strategy before 1996 and subsequent changes are too recent to assess.

Supporters of rapid transition point to the benefits of creating the right environment for a market-based economy as quickly and fully as possible, in order to set the scene for future growth. On the other hand, the decline in living standards in the Kyrgyz Republic may be undermining future growth prospects by inducing responses that reduce capital stock; the necessity to sell or slaughter livestock or to cut down fruit trees to cover the current consumption needs of poor families have already been mentioned. There is also evidence that the distribution of human capital is becoming less egalitarian, with changes in the delivery of education and health care. Particularly worrying for long-term growth is the drop in kindergarten enrollments; in the Kyrgyz Republic about a third of the relevant age group, attended kindergartens in 1991, but by 1994 enrollment rates had fallen below 10 per cent of children in the target age group as state enterprises and collective farms came under pressure to impose charges or reduce quality or divest themselves of kindergartens. Such inequality of assets reinforces the likelihood that underprivileged children will grow up to be poor, and this reduces the prospects for long-term growth.

Kazakhstan is less vulnerable to the vicious cycle of poverty because of its higher initial living standards. It may, however, be a less satisfactory test of the benefits of rapid reform, because the government is widely believed to have failed to provide the framework for good governance required for a successful market economy. Moreover, widening inequality and severe reductions in public spending on education and health undermine future growth prospects, even if they do not lead to the immediate asset liquidation observed in the Kyrgyz Republic.

Uzbekistan has pursued a more gradual transition strategy, which can be directly linked to the lesser fall in GDP than and

perhaps with less severe inequality than in the Kyrgyz Republic. In part, the relative success in protecting those most threatened by transition could be due to policy innovations such as decentralization of social assistance through the *mahallah* system or to private transfers, but we do not know of any firmly-based quantitative assessments of these relationships. What is more readily documentable is that Uzbekistan has been the most successful CAR in terms of protecting the level of government spending and minimising cuts in health and education, and this could augur well for the future. In Uzbekistan, however, the government still keeps a heavy hand on the allocative mechanism, and this discourages entrepreneurship and, especially, the creation of new private enterprises. Whether the net implication of Uzbekistan's initial strategy for sustainable long-term development is positive or negative is as yet unclear.

Any overall assessment of the relationship between policies and performance in Central Asia is thus conditional. The Kyrgyz Republic has pushed further with the reforms advocated by many outside advisers than the others, but its performance in the first half decade after independence was disappointing. More seriously, increased poverty associated with rapid transition may undermine the sustainability of Kyrgyz development. Turkmenistan, with its strategy of minimising economic change under a highly personalised government, has performed poorly; inflation is still not controlled and there is no immediate prospect of economic growth. By 1995/96 the economic stagnation was placing severe pressure on the sustainability of the no-change strategy. Less predictable is the sustainability of the current strategies in the two largest CARs; and these two occupy an intermediate position between the Kyrgyz Republic and Turkmenistan in terms of speed of reform. Therefore, whether future growth prospects are rosier in the unrestrained

crony-capitalism of Kazakhstan or the more regulated paternalism of Uzbekistan is the key issue for the next decade.

**MECHANISM FOR COORDINATED DEVELOPMENT OF THE ENVIRONMENT AND ECONOMY IN THE LESS DEVELOPED REGIONS OF CHINA**  
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The development gaps between the eastern, middle, and western parts of China have existed for a long time and have increased particularly while the national economy has been growing rapidly since the policy of 'Reform and Open' was introduced in China.

The results of classification analysis based on fifteen indicators illustrate that the development levels in three cities; Shanghai, Beijing and Tianjing; and in six provinces; Liaoning, Jiangsu, Zhejiang, Fujian, Shanong and Guangdong; located in eastern China, are higher than the average of the whole country. The per capita GDP was about 120-395 per cent of the national level in 1996. The development level in the 12 provinces located in the middle of China are close to the national level. Their per capita GDP was in the range of 66-115 per cent of the national level. Nine provinces located in the west of China have typical features of less developed regions. Their per capita GDP was only about 37-92 per cent of the national level.

The volume of pollutants generated from industries coincides closely with the growth in GDP, and this might be called 'pollution by economic forces'. The pollutant load is relatively lower in the less-developed regions, particularly in the western provinces where the discharges of waste water and gas from industries are only one third of those in developed provinces and the pollutant loads per

unit of land are only about five per cent of those in eastern provinces.

The most obvious distinction between the developed and less developed regions is seen in the differences in ecological conditions. The less developed regions, particularly the western provinces, are located in an area with ecological conditions that are fragile, and they are facing a lot of problems in terms of ecological damage and degradation. For instance, decline in vegetation, loss of ecological integrity, loss of soil and water, desertification, soil salinisation and acidification, shortage and deterioration of water resources, grassland deterioration, decrease in biodiversity, and so on. Owing to the poor economy, the impacts of ecological damage and pollution are also greater than in other areas.

Although the west has the advantage of being the late comer, it cannot expect technology and management to make much contribution to economic growth because of the existing economic conditions and the fact that it is in the preliminary stages of industrialisation.

Western provinces have to promote transformation of their economies by carrying out integration of environmental and economic decisions. The west has great potential for development of mineral and energy resources. However, the pollution caused by these industries needs to be carefully managed in the fragile environment of the west. The main obstacle is shortage of finances to support environmental protection. Most of the poor counties identified by the national government are located in the less developed regions and, according to the policy for 'polluter control', they have to bear the costs of reducing pollution. There is the possibility of some industries in the developed regions moving to the less developed regions, with increasing environmental standards in the developed areas.

The less developed regions should focus on five aspects, i.e., speeding up economic growth, improving the patterns of economic growth, promoting integrated decision-making for environmental and economic interventions, raising environmental investments, strengthening support by the national government to less developed regions, and building new mechanisms for coordinated development of the environment and the economy.

**KAZAKHSTAN'S PROGRAMME FOR  
SUSTAINABLE DEVELOPMENT:  
ISSUES OF SUPPORT FOR SCIENCE AND  
INFORMATION**

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Sustainable development calls for an integrated and balanced approach to attaining the aims of economic growth, social equality, and environmental protection to provide maximum benefits for the present generation and greater opportunities for future generations. These principles should be of utmost importance in scientific programmes for development strategies.

Certain advances were made by Kazakhstan from 1992-1997 in applying and implementing the above principles. Kazakhstan was the first country in the history of the world to abolish nuclear weapons and become the initiator of an integrated process to rehabilitate the Aral Sea. However, it is essential to achieve consensus about the nature of the main problems to sustainable development, about identifying new pathways and approaches, and about attracting widespread attention to their solutions.

Disintegration of the Soviet Union (FSU) resulted in the formation of a number of new independent states. Kazakhstan, as one of these states, has the benefits of a



strategic geographic location and significant economic potential. The climatic conditions of the Republic are semi-arid in the mountain regions and arid in the plains. The land resources are dominated by deserts.

Past policies towards the natural environment were wrongly perceived in considering land and environment as infinite resources. The short-sighted policy of the Soviet administration resulted in the designation of many regions as military testing grounds. Furthermore, exploitative irrigation policies to support cotton production led to the contraction of the Aral Sea. Excessive ploughing also caused soil erosion and degradation of vast areas of Kazakhstan. Consequently, many regions now face an ecological catastrophe.

The Aral region is in a critical situation, as a result of the sharp decrease of water inflow from the Syrdarya and Amudarya rivers. Unwise water usage led to the catastrophic drying of the Aral Sea and, as a consequence, to the degradation of soil, vegetation, and fauna and progressive aridity and desertification in adjacent territories.

Following the decision to expand cotton production the irrigation and agricultural sectors grew to account for 60 per cent of the GNP.

In the Caspian region, the main form of pollution is associated with the exploitation of oil and gas deposits, of which there are more than 100. At present, as a result of mining, processing, and transportation of uranium ore, there is an unfavourable radioactive situation in the Mangistau area. In the region, there were 140 anomalous places and 120 of them had oil deposits. The uranium mining enterprises of this region also contain most of the radioactive waste.

Past economic growth in Kazakhstan was tied to the industrial production system of the FSU, through which it pro-

vided agricultural products and minerals. The situation has become even more difficult because of the fact that current income from the sale of mining and agricultural products does not cover real costs in those sectors. Vast areas of agricultural land, in spite of its poor state, permit Kazakhstan to harvest on average between 10-20 million tonnes of grain every year. Following the transformation of the agricultural sector, using modern technology, Kazakhstan will become a net food exporter.

The transition period is provoking new and complex issues, and the present Kazakh Government is trying to deal with these through the development of an independent economic policy. As the first step, it involved pulling out of the zone and introducing its own ruble currency. Second, the Government has given priority to developing a programme for the oil and gas sectors – including a project that involves laying an oil pipeline from the Tengiz oil field to the Black Sea. Third, treaties have been signed with western companies such as the American oil giant Chevron, British Gas, and others for the development of oil and gas deposits. However, at present, difficulties still remain with the transport of oil and gas through the territories of neighbouring countries.

The new formula for human development is as follows: a good environment is a sound economy and a sound economy means an opportunity to secure a good environment. People become the focus of sustainable development in society.

Thus, the transition to sustainable development advances the task of designing and implementing statistical indicators of sustainable development that would reflect economic and social and defence security, environmental well-being, employment levels, natural resource consumption, capacity of the economy, ecological damage per unit of final prod-

uct, per capita specific energy and resource demand per unit of GDP, and demand/resource ratio, and so on.

Apart from construction of mathematical and statistical models for monitoring, the use of geographic information systems (GIS) is also increasing. The potential application of modern GIS technologies to environmental and territorial management problems is substantial.

**BALANCING THE STATE AND THE MARKET FOR SUSTAINABLE DEVELOPMENT: A POLICY ECONOMIST'S PERSPECTIVE ON THE CHANGING ROLE OF GOVERNMENT IN THE FORMER SOVIET REPUBLICS OF CENTRAL ASIA**

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Since gaining their independence the former Soviet states in Central Asia have taken on the responsibility for their national development. Aided by western institutions, they have entered into a transition from the Command Soviet Economy towards market economies. Ever since Adam Smith, economists have seen the provision of the framework within which businesses operate as one of the functions of government. In the context of the transition taking place in the former Soviet Union, it is important that the role of government in promoting the market economy acknowledges that markets are not simply locations of economic activity. They are also important as locations of social interaction. In order for marketeers to evolve and function effectively, the government needs to address the social dimension of market operations alongside the legal and institutional dimensions. If these are addressed, then market oriented economies have a good potential for achieving sustainable development.

Structural adjustment and market liberalisation are necessary but not sufficient

conditions for sustainable development. Sustainability depends upon a socioeconomic system's ability to adapt and take advantage of evolving circumstances. Since no one has the monopoly on correctly interpreting the future, effective adaptation is more likely if decision-making is devolved to the lowest possible level, rather than being concentrated in a central planning authority. It is certain that decisions will be made that prove to be unwise. Nevertheless, in a devolved management system, the decision-maker is in the best position to identify errors and to take prompt remedial action. Insofar as the wisdom (or otherwise) of a decision is demonstrated through market operations, then the more efficiently markets work, and the clearer the market signals are, the better. Where there is a direct and obvious link between decision-making responsibility and income received, then the decision-maker also has every incentive to be responsive to market signals.

In the former Soviet Republics of Central Asia, governments need to address two particular legacies of the former regime. The first is a tendency for enterprise managers to look to an authority for directives rather than to take responsibility themselves. The second is the view that the use of one's position for short-term personal advantage is normal and expected.

As far as agriculture is concerned, the first legacy can be partially addressed by changing policies from prescriptive and commodity orientation towards a broader goal orientation. Thus, for example, policies for food self-sufficiency, export promotion, and import substitution are more appropriate than having specific commodity production. Within these broad frameworks farmers and other enterprise managers should be free to decide which crops to grow. However, broader policy objectives and managerial freedom need to be complemented by skill development so that farm man-

agers can identify the enterprises that are likely to be most profitable on their farms. This will require a re-orientation of management and technical training so that managers are equipped to compare alternatives rather than simply knowing how to undertake a task in the prescribed manner.

In order to overcome the second legacy there has to be a general acceptance that, as a result of the economic reforms, the 'rules of the game' have changed, but there are still rules and it is not a free-for-all. This acceptance has to start at the top; societies tend to follow the lead of opinion makers (especially politicians). Laws to regulate market behaviour must be made to limit the exploitation of the weak. However, legislation should be framed in such a way as to promote competition and avoid abuse of market power. It will not be enough to put laws on statute books. Laws have to be enforced, objectively and equally for all members of society if they are to provide a framework for business transactions. As long as input traders and bankers fear farmers can 'strategically' default with impunity and farmers fear that they will not be paid fairly and on time for their produce, then market relations will remain rudimentary.

**ENVIRONMENTAL POLICY OF MONGOLIA**  
**T. Enebish**

*Director General, Strategic Management  
and Planning Department, Ministry of  
Environment, Mongolia*

The traditional Mongolian lifestyle that had developed in harmony with nature over many centuries was greatly disturbed and changed over more than 200 years of rule by the ancient Mani Chin state and because of European socialist ideas, technical revolution, and a centrally planned economic system over the last 60 years.

Improper use of natural resources as a result of mismanaged urbanisation and

industrialisation processes in Mongolia at present is a matter of serious concern. Half of the total cropland and 1/3 of the total pastures are degraded. There have been reductions in soil fertility by as much as 20 per cent, forest resources by a 1/3 and animal resources by a 1/5. About five million hectares of land in the Gobi have been affected by sand shift; more than 300 lakes, rivers, streams and springs have been affected; and more than 100 animal and plant species are threatened by extinction.

Transition to democracy and a market economy, which started at the beginning of the 1990s, has given us a great opportunity to re-assess the historic path and to chart out an environmentally sound and sustainable development approach.

The new Constitution of Mongolia adopted in 1992 guarantees the right of citizens to live in a healthy and safe environment. Adoption of environmental laws, covering lands, protected areas, underground resources, mineral resources, environmental protection, water, forests, hunting, plants, and air, has been an important step in creating a legal framework for environmental protection.

These laws were formulated on the basis of a detailed assessment of the quantity and quality of natural resources and the life-sustaining capacity of nature. They reflect many important issues — including fees for natural resource use and proper and efficient use of natural resources. These provide the foundation for further development of bilateral and multilateral cooperation in the field of environmental protection; and in addition a number of environmental projects are being implemented.

The Government of Mongolia has not only made an attempt to accelerate development, but also to protect and maintain the pristine environment of Mongo-

lia. Environmental issues for international cooperation have been identified.

- ▶ Foreign trade should meet the requirements for protecting people from toxic chemicals, conserving gene pools of animals and plants, ensuring ecological safety, and sustaining ecological carrying capacity.
- ▶ Scientific and technical cooperation should be established in the field of introducing and transferring environmentally-sound technology, re-introducing rare animals, planting trees, expanding the network of special protected areas, combatting and preventing natural disasters and hazards, forecasting weather, ecologically-clean production, and promoting environmental management and information systems.
- ▶ Promotion of international cooperation to carry out joint studies on Mongolia's specific nomadic traditions and customs — which are in full harmony with nature, raising public awareness of these among other nations, and developing environmentally sound economic activities and lifestyles.

Mongolia will support the proposal to include its territory in the world biosphere reserve and will cooperate with nations who support the proposal.

**PRIMARY INTEGRATION OF SOCIOECONOMIC AND ECOLOGICAL OBJECTIVES IN CRITICAL LAND USE DECISIONS**

***Prof. Peter Treuner***

*Director, University of Stuttgart, Germany*

Land is the most substantial asset with regard to the functioning of ecosystems on which various types of human activities depend. The implementation of every development plan will bring specific changes in land use and will consequently result in a certain new form of land use. It is important to provide concepts for a better land-use policy in terms

of practical applications of sustainable development concepts. This can only take place if land-use planning takes into account sufficiently and operationally the degradation of environmental quality and vice versa.

In most situations, land-use decisions are still very much characterised by a traditional, secondary integration approach that firstly considers the needs of socio-economic development and, only secondly, and mostly insufficiently, taking into account requirements of environmental and resource protection. Social, economic, and environmental objectives in a given administrative territory are consolidated and implemented by quasi independent sectoral plans. This problem is particularly serious in the regions, that are growing rapidly in economic terms, of which South-East China is a typical example, and in areas that are ecologically sensitive; and the arid and semi-arid zones of Central Asia are typical examples of the latter.

It would be totally unrealistic to conceive a radical change of policies in the sense of giving some sort of absolute priority to the objectives of environmental and resource protection; and of pursuing economic and social objectives only within the constraints of long-term ecological objectives. Therefore, a compromise is necessary. The present growth-oriented approach must be replaced by a more balanced approach that also takes ecological concerns into account. The relative importance attributed to the two basic components might then be continuously adapted towards a greater role for ecological concerns when and where affordable.

The objective of this paper is to briefly present a methodological framework for a primary integration approach relating to land-use planning. The final output of this approach is a matrix that provides a set of planning oriented categories of land-use potentials.

The principal idea is to provide a planning-oriented classification of land, at a sufficiently low level of spatial aggregation, by integrating all the relevant key aspects into a consistent framework of hierarchical matrices. The classification, if carried out with the aim of considering concomitantly and in a balanced way all the main social, economic, and ecological requirements and constraints in the early stages of land-use planning, could be used as an input into the subsequent decision-making process (in particular zoning decisions).

Generally speaking, the overall process of conceiving and implementing a method for truly integrating socioeconomic and ecological considerations with regard to classifying land-use potentials is comprised of three main tasks as follow.

Firstly, to produce criteria and thresholds that are logical and pragmatic to a sufficient degree (i.e., applicable) as inputs into decisions on land use

Secondly, the institutional organization of the collection and classification of information (i.e., the implementation of the logical system of criteria and thresholds)

Thirdly the institutional organization of subsequent political decisions which establish practically applicable categories of land-use as an input into the planning (zoning) decisions of interested parties such as local governments.

Particular attention with regard to methods of overcoming apparent weaknesses in existing land-use decision mechanisms – and particularly in China – should be given to the following.

- ▶ The improvement of the legal conditions within which mechanisms function
- ▶ Establishment of formalised procedures of decision-making about the use of land resources

- ▶ The improvement of coordination mechanisms and of the supervision of government decisions
- ▶ The necessity of enforcing the competence assigned to each level of government
- ▶ Augmentation of the role of financial instruments with respect to the implementation of national development strategies

Training personnel with the purpose of improving the professional capabilities of politicians/officials is considered a very essential aspect with respect to the success of the implementation of national legislation on land-use planning.

Development in China, which fundamentally depends on social and political stability and on overcoming the problems related to the large and ever growing population, will only come close to achieving the objective of sustainability, if the country's limited natural resources are safeguarded for future generations. To ensure this the present degradation of the environment should be reduced and stopped. Such a strategy requires further improvements in legislation and in the implementation of legislation of government decisions on development at all levels. The economic reforms that began in 1979 provide the government and population with opportunities to undertake and experience reforms in every aspect of development.

**THE RISK PRECAUTION APPROACH TO  
SUSTAINABLE DEVELOPMENT**  
**King-yu Kwok**

*The Centre for Urban Planning and  
Environmental Management  
The University of Hong Kong*

Following the industrial era, we are now in the stage of a risk society. The emergence of a risk society signifies the empowerment of the people in environmental protection and the legitimisation of individual contributions to risk evalua-

tion. Pollution, as a kind of risk, is posing harm and potential harm to human and environmental well-being. There has been a growing public involvement in environmental policy setting in order to remedy the situation. It is not possible to definitely predict or control our present environment through the scientific and technological-fix approach. Policy-making has gone beyond the criteria of scientific certainty. There has been a growing advocacy worldwide for a precautionary or preventative approach to managing the environment. Greater attention is being paid to how the public think. There has been a growing consideration about scientific uncertainty and local norms and values with reference to the fundamental needs of the people in environmental policy setting.

A Risk-Precaution Model is presented to throw light on the current and future management of our environment. This model, following the human conceptual framework, stresses the importance of paying attention to our fundamental needs and associated risks and of employing a preventative approach to proper environmental management. There is an emphasis on a participatory and cooperative approach in sorting out the route to sustainable development. The application of this model, as related to local conditions in Central Asia, is also discussed.

#### **ECONOMIC AND CULTURAL DEVELOPMENT**

**Peter M.K. Wong**

*Silk Route Travel Agency Ltd  
Hong Kong*

In Hong Kong, the Silk Route Travel Agency has been established to promote cultural tourism and to rediscover the 5,000 years of history and the cultures of the Chinese Silk Road in order to enlighten and educate visitors with the support of local governments.

#### **The Facilities**

The author has invested in hotels along the Rilk Route, three have already come up and more are to come. They are located in Guangdong, Gansu, and Xinjiang. They are called Cultural Hotels, and they embody the historic architecture of different times and highlight the lifestyles of bygone era; all this is presented with modern day comforts, offering traditional food and entertainment.

#### **Souvenirs**

Memorabilia of new products and themes are being developed for sale through a Special Theme store called 'Bazaar', as a way of preserving the culture and history.

The opening up of the markets in North Western China provides investment opportunities. It is a self-educating and fascinating opportunity not only for the Chinese themselves but also for western tourists. Thus, we are educating people through cultural tourism in history, culture – where east meets west — and where trade and cultural exchanges are spontaneous.

#### **Cultural Products**

It is imperative that the Silk Road is extended in time to Central Asia and Europe. The opportunities are manifold: cultural hotels, tourism, and shops. This is where economic and cultural developments take place side by side. The aim is to learn from the past that war and conflict will bring misery and tragedy whilst peaceful coexistence with tolerance and acceptance can bring harmony and prosperity. This is a business with a mission.

The first 'Bazaar' shops with mementos have recently opened in Guangdong. It is envisaged that they will be franchised in other parts of China and the world by the turn of the century.

## **Environmental Protection**

The response to the cultural hotels and souvenirs is great. It is often a challenge to protect some of the locations – combining cultural preservation with ecological protection. The author calls upon all to join and share in this endeavour. Currently, insufficient air connections deter some people from travelling to this area.

New tourist sites that have opened up in North West China have highlighted wildlife watching. Though hunting practices in the past several decades have endangered many life forms, it is necessary to manage this well. Efforts are being made to educate the local ethnic people in the idea of ecological tours rather than hunting tours and the author sees the close linkage between ecological tourism and cultural tourism.

## **Missions to Share**

As to the development of Central Asia, the same theme could be adopted. The long history and diversity of the ethnic groups in Central Asia offer many tourist attractions, the diverse lifestyles and ethnic arts and crafts would add colour for all to appreciate. The author would be happy to cooperate with government or private parties interested in furthering the concept in this region with those who share these common missions and vision.

## **Conclusions**

The presentations and the discussions that followed raised the points highlighted below.

### **Neglect of Economic and Environmental Considerations in Planning**

In all the countries that had a centrally-planned economy, there were major economic and environmental problems.

Economic problems were related to loss of incomes and employment opportunities; and these included removal of subsidies and the closure of many basic services. These changes had a greater impact on poorer groups and increased inequality. Environmental problems were also widespread because of the misuse of natural resources and lopsided industrial development without adequate environmental safeguards. More recently, all the countries had made a concerted effort to improve their economic performance and environmental management but faced many difficult challenges; and among these lack of adequate resources figured very prominently.

## **Alternative Approaches to Reform**

While all the countries were committed to pursuing a path of sustainable development, the route chosen was not always the same and each approach had its merits and drawbacks. Those choosing the 'quick reform' path had experienced a decline in living standards, growing inequality, cutbacks in public expenditure, and a situation in which the poor were suffering more than other groups. Those following a more gradual transition continued to experience the heavy hand of the government, discouragement of the private sector, and lack of entrepreneurship development. Policy-makers needed to learn from each others' experiences in order to avoid imposing severe hardship on the people as well as loss of private entrepreneurship and investments.

## **Harnessing Human Resources**

The education and skills of the inhabitants in the countries of the former Soviet Union were important assets for the region and need to be mobilised for the sustainable development of the area. At the moment skills are not being used because of lack of resources. There are many skills that could be used profitably

to improve the natural resources and environment conditions.

### **Promoting Market Liberalisation and Development**

The removal of state control did not always guarantee the development of sound markets. In order to do so, appropriate legal and institutional measures were needed. In addition, the laws needed to be enforced and made applicable to all concerned. There was still the tendency to look for directives and to use one's position for short-term personal gains. Markets represent a phase in social development with acceptance of new values and rules of the game. An important aspect of this liberalisation and development was to promote decentralized decision-making so that errors are quickly identified and remedial action taken.

### **Integration of Culture and Economy**

This region had a very rich culture, and ways to integrate with economic devel-

opment needed to be identified. Various aspects of cultural promotion could be profitably integrated with tourism development, while other aspects needed to be systematically documented, assimilated, and protected for posterity.

### **Planning, Integration, Monitoring and Training**

Rapid changes were being seen in many areas, but there was little understanding of the factors behind and the impacts of these changes. There was also a need for better integration of the different components of society and the environment. All of these required new information, new analysis, new indicators, and more comprehensive methods of integration such as the use of GIS. This required training and knowhow.

### **Adequate International Support**

The entire region is in a state of transition. At present, these countries require substantial external cooperation in managing both their economies and their environment.





# Participatory Approaches: The Role of Education, Culture, and NGOs

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**Chaired:**

Dr. Shirin Akiner,  
SOAS, UK

**Introduction**

One of the key lessons in development from all parts of the world, including Central Asia, is the crucial importance of people's participation in all aspects of development. If governments are very serious about moving towards sustainable development, measures to promote participation in all aspects of the economy and the environment are a necessary precondition.

For countries with a long history of centralized government, change takes time; people need to learn to work together and make their own decisions rather than being told what to do.

There are many good examples of successful development initiatives in which people's participation and management have played key roles. One of the most encouraging experiences comes from war-torn Afghanistan where, even amidst all the fighting, people are working together to sustain their economic and social activities.

Historically, most communities had their own internal mechanisms for decision-making for many aspects of the economy, environment, and social life. Big governments have changed much of this in the past, but there is a new movement to promote local action and initiative to ensure that societies move towards sustainable development. Obviously the local people must get an opportunity, but they cannot do it alone without strong support from the government and also from the international community.

Participatory Approaches: The Role of  
Education, Culture, and NGOs

## **Major Issues and Experiences**

### **PUBLIC INTEREST IN DEVELOPMENTAL AND ENVIRONMENTAL INITIATIVES**

**Tim Grout-Smith and Patrick Worms**

*TACIS Environmental Awareness Programme (TEAP)*

Development experience is largely based on the classic Third World studies (Africa, South Asia); tropical ecosystems; post-colonial structures; and poorly-educated, village-based populations. There are significant differences between development experiences in the arid Central Asian plains and mountains and its post-Soviet structures and Communist organization. However there are certain common aspects that should also be applied to Central Asia if initiatives for sustainable development are to be successful. These are examples of successful local initiatives and activities - such as the WFP project for erosion control at Mizhi in Shaanxi province 1989; the Water Users' Association Tacis project in Jallalabad, Fergana, Kyrgyzstan, 1995; the experience of the USAID-Israeli irrigation scheme at Kolkhoz Ahmed Yasavi, Cherchik rayon Tashkent, Uzbekistan 1996; and the problems highlighted by Tacis Water Resources' Management and Agricultural Production in the Central Asian Republics (WARMAP) Project Uzbekistan 1996.

Development initiatives will only work if people are convinced of their relevance and importance to their own well-being, and if the land ownership and local government structures allow people to feel responsible for their own actions. The Aral Sea disaster is a good example of the top-down approach totally wrecking natural resources.

In this context, TEAP's attempts to raise public awareness and involvement in environmental decision-making is at the

heart of sustainable development. The recent Kazakh decision at the European Environment Ministers' conference in Aarhus to sign the Convention on Access to Environmental Information should be welcomed. The TEAP has made efforts to engage in sponsored programme makers, environmental 'advertising', parliamentary liaison, NGO training, and training of environmental journalism students; (*a twenty-minute video diary of the project is available on VHS*).

### **THE COMMUNITY FORUM AN EXAMPLE OF SUSTAINABLE CIVIC INNOVATION IN AFGHANISTAN**

**Samantha Reynolds**

*Regional Programme Manager, UNCHS Habitat, Afghanistan*

Afghanistan has been at war for the last twenty years and is currently experiencing another major upheaval. The Taliban are on the offensive, capturing most of the country. They look set to take total control. In July this year, all the NGOs left Kabul, the capital, and only 'life saving' UN programmes continued, as it became increasingly difficult to work under the Taliban edicts following their failure to honour an agreed Memorandum of Understanding on Humanitarian Assistance. Then, in August, all international UN staff were evacuated following the US air strikes against suspected terrorist training camps. Now the Iranians are conducting military manoeuvres on their border and all surrounding countries are watching nervously or taking interventionist action. In addition to these problems, Afghanistan faces the same problems (identified by this conference) as its Central Asian neighbours. In addition, it has one of the largest refugee populations in the world, has one of the lowest levels on the Human Development Index, and has a massive brain drain and flight of capital.

Against this backdrop, the UN has, over the years, been assisting in the country's

rehabilitation and, through its political wing, been trying to broker a peace settlement. Currently, the UNDP has a two-year programme to rebuild communities under its PEACE initiative (Poverty Eradication and Community Empowerment). UNCHS Habitat is implementing the urban component of this, based on a strategy developed in the northern city of Mazar-i-Sharif during an earlier phase of the programme which aimed to rehabilitate the urban areas (1995-1997). It is working in the main cities of Afghanistan as well as in the mountainous area of Hazarajat in central Afghanistan, a rural area famous for its Buddhist heritage with 150ft statues of Buddha carved into its cliff faces.

The Community Forum and the concerned development organizations enable communities to rebuild local systems of governance, develop local administrative and management systems, contribute to socioeconomic recovery, and improve their local environment. Communities are able to govern their own affairs and make informed strategic choices about how to invest the resources that they have based on sound economic analyses which include environmental and social considerations. They are able to generate, through the community enterprises, not only employment and hence livelihoods, but opportunities for vocational training and the production of locally needed goods and services at affordable prices using local materials. It is also able to achieve economies of scale through cooperative purchasing schemes that contribute to the area's economic recovery from its primarily agricultural base. At the same time, the educational courses are an opportunity for the community not only to improve the quality of and accessibility to education in the area, but also to introduce concepts and ideas relevant to their immediate environment and to inculcate civic principles related to rights and responsibilities.

Significantly, the programme has thrived in both the urban and rural areas and has been unable to keep up with the community demand for more. They have largely survived the vicissitudes of war, although, no matter how sustainable they are as systems, like a tree they can also be felled by the axe of war and political policies that run counter to principles of civic engagement.

**KARATEGHIN-ALTAI AS THE TRANSPORTATION CORRIDOR: A KEY TO INTEGRATION OF REMOTE MOUNTAIN AREAS INTO THE CENTRAL ASIA ENVIRONMENT?**

**Dr. Yuri Badenkou**

*Institute of Geography, MAB  
Russia*

The eastern provinces of Karateghin, Darvaz, and Vahio are peripheral, underdeveloped mountain areas of Tadjikistan. The factors that created this situation are given below.

- ▶ Remoteness of these mountain territories from the main political centres (Dushanbe, Houjant, Kurgan-Tiube) and the resulting efforts of local leaders to gain greater autonomy
- ▶ Traditional conservatism of the local population in relation to political and economic innovations, which is a general feature of mountain communities
- ▶ Discriminatory social and migration policies of the central Government: these regions were the most heavily hurt by the large-scale migrations to cotton plantations in the Vaksh Valley
- ▶ The investment policy pursued by the central Government was not of benefit to the economic development of these regions

These territories included the easternmost Jirghital region where the ethnic majority were Kyrgyz nomads.

After the changes in the former USSR, the support to these regions from the state budget diminished even more dramatically. During the current economic and political crisis in Tadjikistan, the situation of the Karateghin regions became even worse. These regions are completely isolated from the central areas of Tadjikistan and suffer from intricate conflicts for power between local leaders. As a result, the local population suffers from poverty and malnutrition.

Nevertheless, in view of its geographical situation, Karateghin may have an outstanding role in the economic revival and development of Tadjikistan, as well as in the broader region. This may be realised through the formation of the transportation and economic corridor along the Valleys of Surhob and Kyzyl-Sun (Altai Valley, Kyrgyzstan) which opens to Sary-Tash. SaryTash can be seen as the major node of the Trans Asian transportation network: it completes the Pamir Tract and opens the route to Kashgar (Kashi) in China, thus forming an integrated route with the Karakoram Highway.

This transportation corridor may provide the following advantages.

- ▶ Operation in all seasons: the route, which follows one river valley system of Vaksh-Surhob-Kyzyl-Suu, has no high passes or inaccessible sections. Three passes in China (Simhana-Ulugchat-Kashgar Highway) are open 11 months a year.
- ▶ Existence of a road network (only a few sections of the 750-km long route are missing currently). The whole section from Dushanbe to Kashgar has an asphalt or pebble-stone cover.
- ▶ The distance from Dushanbe to Kashgar is only 750-800km (540km from Garm, 465km from Jirghital).

Implementation of this Project may prove beneficial in several ways.

- ▶ It will support integration of the marginal, peripheral, and poorly developed regions into the general development context of Central Asia. This integration requires the political will of Tadjikistan, Kyrgyzstan, and China based on inter-governmental agreements
- ▶ This transportation zone can be a catalyst for economic and social development of the adjacent regions within the watershed of Vaksh-Surhob-Kyzyuu.
- ▶ The zone of the proposed transportation corridor is inhabited by numerous nations and ethnic groups: Tajiks, Kyrgyz, Kazahs, Uigur, etc, which constitute an outstanding cultural community requiring preservation and protection.
- ▶ Although this region has long since been inhabited by human populations, the industrial impacts are minimal because isolation and marginality; and thus the little modification to the cultural landscapes (developed by Kyrgyz nomads and Tajiks - irrigated land cultivators); have been experienced. The magnificent beauty of the mountain ranges and depressions suggest possibilities for development of protected territories, national parks, and tourism.

#### **NATIONAL CAPACITY BUILDING IN KYRGHYZSTAN**

*Dr. Makeyev, Kyrgyzstan*

The National Capacity Development Programme was started in 1997. It has adopted the concepts and principles of sustainable development, and these include integration of society, overcoming internal and external isolation as a land-

locked and mountainous country, overcoming natural disasters, human and social development, and democratic management of the economy and the society. It also emphasises the sustainable use of local resources and seeks to consolidate the national interest in developing stability and support for national strategy. It outlines a strategy for the climatic environment and the need to integrate it with science. It calls for special action plans for implementation that should include the legal basis as well as the mechanisms for cooperation at all levels of society.

The natural resources in the country were influenced by its special geographical situation. If, on the one hand, it provided opportunities for development, there were also many limiting factors. It was a landlocked country and consequently the need to open the Silk Route was emphasised. The country had an abundance of fresh water resources formed by glaciers. There were 30,000 rivers which were 100,000km in length. The country had 1,000 lakes and much of the water was used by the country and its neighbours for irrigation. There were over 30,000km of irrigation canals that were causing major natural disasters in the country. The country also had some minerals, but its most valuable resources were the bioresources that needed to be managed on a sustainable basis.

The state is strongly committed to the sustainable use of natural resources. Its philosophy is that human and environmental development should go together. There is a possibility that economic difficulties could threaten sustainable use of natural resources and the factors behind such instabilities should be better understood and addressed. The most important issue is the need for close cooperation between the people and the state. It is always easier to prevent disaster than to try to struggle with its impacts.

## **EFFECT OF POPULATION RESETTLEMENT ON SUSTAINABLE LAND USE**

**Prof. Wang Yi-ming**

*Ningxia Office of Territorial Management  
and Regional Planning, Yinchuan, China*

The Ningxia Hui Autonomous Region (Ningxia in short) is a typical desert area in northwestern China. From 1983 to 1995, a programme for population resettlement was conducted. More than 150,000 poverty-stricken farmers were relocated from the overpopulated villages in the water eroded hilly areas in southern Ningxia to the newly-reclaimed irrigated areas in mid- and northern Ningxia. The previously desert steppe with a small population density was developed into a promising oasis. The methods, benefits, and experiences of the population resettlement are of general interest.

Located in the upper reaches of the Yellow River, the Ningxia Hui Autonomous Region (Ningxia in short) is one of the typical desert areas in northwestern China. Around 3.77 million hectares (or 72.8 per cent of the total territory of Ningxia) suffer from land deterioration.

With the construction of irrigation systems, this area has developed into a promising oasis for agricultural activities. Infrastructural construction to establish roads, electricity supplies, communications, etc, were also undertaken.

The farmers were organized to resettle in the newly-reclaimed areas. House construction, land preparation, tree planting, and cropping were subsidised by local financing through small preferential loans. The resettlers were mainly poverty-stricken farmers and resettlement was voluntary. The newly-reclaimed land was distributed on the basis of the number of people in a household, a contract for long-term use, and the right to inheritance.

The net income per capita in the Gu-Hai Area increased from *yuan* 30.5 before irrigation in 1980 to *yuan* 1,689 under irrigation in 1995. Around 80,000 poverty-stricken people were removed from the hilly areas in southern Ningxia to the irrigated areas. Through plentiful inputs of labour and water, the previous deteriorating steppe, deserted land, and low-yielding rainfed farmland were turned into a promising oasis. Before the reclamation, the soils were mainly sand-blown with very low contents of organic matter and nutrients. Through cultivation, fertilizer application, and irrigation with silted water from the Yellow River for several years, the physical and chemical features of the soils were improved and soil fertility was enhanced.

The increase in vegetation coverage reduced the impact of winds and sandstorms.

In the newly-reclaimed, pump-irrigated areas, the layer of soil was relatively thick, the underground water was buried around 20m deep, the salt content in most of the areas was low, and the pumped water was of high quality.

The migration of poverty-stricken farmers from the overpopulated villages in the water-eroded hilly areas to the newly-claimed pump-irrigated areas alleviated the pressure of over population on the land resources and environment of the areas of origin.

Some of the issues that require attention are water-use efficiency, guidance of monocropping systems, and development of forests. The application of barnyard manure should be encouraged. Secondary soil salinity should be prevented through rational irrigation. Rural energy supplies should be carefully managed. Rats should be controlled. Rural industrial parks should be planned and industries that might be a

source of pollution should be prohibited. The overgrowth in population should be controlled.

#### **ENVIRONMENTAL LAW IN RUSSIA AND KYRGHYZSTAN**

**Betty Davis**

*Germany*

Environmental laws in the Central Asian countries go back to the period of the former Soviet Union in the early 1920s. On paper everything was regulated and private ownership was abolished. It was replaced by the right to use different natural resources, and various regimes for using these natural resources were implemented. In 1921 the Protection of Nature Heritage was introduced as the first environmental law.

There were two main branches in the environmental system that were being developed. The first one dealt with the management of the natural environment and resources based on scientific principles and the second one dealt with elaborate resource-oriented administrative guidelines for different organizations responsible for dealing with various natural resources.

In practice there were many problems and many new laws were introduced during the 1960s and 1970s. Environmental protection was also incorporated in the constitution and a new Ministry of Environment was also established in 1986.

The new countries of Central Asia have inherited this system and have made various changes over the years. Changes in the Environmental Acts include the rights of citizens to a healthy environment, the polluter pays principle, commitment to sustainable development, access to information, and the concept of environmental liability. In Kazakhstan and Kyrgyzstan environmental charges for pollution are being used to finance environmental protec-

tion agencies.

The main difficulties are the lack of integration between the organizations involved and no role for the private sector in the past because of the absence of private ownership of resources. Because of the role of different actors, apart from the State organizations, continuing dialogue, procedural laws, and appropriate organizational changes are needed to accommodate multi-party interaction and decision-making. Another issue is that some of the highly scientific systems in place could prove to be very difficult for the private sector implement. There are many specific laws that are not as yet in place, and there many confusions and gaps in the present coverage by environmental laws. All of these are complex and difficult and should be resolved by involvement of the different actors concerned.

**COMMUNITY DEVELOPMENT IN NORTHERN PAKISTAN**  
**Greg Mortensen**

*Central Asia Institute, Montana  
USA*

As we discuss and seek to draft strategies on sustainable development, it is important to realise and appreciate that local communities, such as those in Baltistan in Northern Pakistan, had self-sustaining practices for hundreds and probably even thousands of years. It is only with the introduction of industrialisation and exploitation from the West and the East that these are being questioned. It is necessary to recognise these self-sustainable models and learn from the experiences of these people. This area in northern Pakistan can be seen as a 'wasteland of war' — a war that has gone on between India and Pakistan for over 10 years. The degradation of the natural environment has been enormous and communities are cut off from the rest of the country for long periods. This area is the home of the Karakoram range with the largest group

of highest peaks in the world. It is also the head of the Indus River. The damage to both the ecosystem and wildlife, particularly the ibex sheep, has become a matter of serious concern. The army has been very responsive and helpful about restoring the environment.

The problems of the area are complex. It has been neglected within the country because of difference in religious sects. It has also been adversely affected by the anti-Islamic posture of the West. There is need for more education about Islam in the West in order to overcome biases against Islam.

Regarding future development of the area, emphasis has been on the micro-level, working small-scale with locally initiated projects. These are found to be both self sustaining and successful. There were initial difficulties, but they were overcome by working closely with local religious leaders, pointing to the role of religion in promoting self-sustaining models. Emphasis should be on the local communities deciding their own agenda in order to start the building blocks of development. Once this is in place, it can be facilitated by NGOs. Economic considerations are also important and attention should be given to rooting activities to local resources.

The communities in the northern areas have been underserved for a long time, and it is essential that assistance be provided to serve these people. There is also a need for a continuing evaluation process so that we can learn from our experiences.

**Conclusions**

Experiences throughout Central Asia, including China and other areas, strongly support the idea that projects become more sustainable with the full participation of the local people. Once people are motivated to participate, they will come up with solutions that are more



in line with their needs. Many good projects have failed because they did not consider it necessary to involve local people.

Description of the experiences in raising public awareness about environmental problems and sustainable develop-

### Points To Be Considered in the Context of Participatory Approaches

- ▶ Role of empowerment and the use of education as an entry point
- ▶ The decentralization of authority
- ▶ Sustaining organizations established at times of crises
- ▶ Mechanisms used for consultation with people and identifying local decision-makers
- ▶ Need for peace to sustain local development
- ▶ Importance of changing attitudes along with changes in laws in the context of environmental law
- ▶ Nature of environmental changes
- ▶ Methods to improve incomes of people in remote areas

ment in parts of Central Asia would help replicate such successful initiatives elsewhere.

Many projects and activities were imposed upon communities during the former Soviet Regime without any attention being given to the needs of the communities or their environmental impacts.

There are many differences between countries of the former Soviet Union and the classical third world, and it is important to consider these when applying development models and approaches.

Rebuilding a community that is in a state of collapse following a war is difficult.

One has to devise specific mechanisms in order to be successful. It is important to get women to organize and participate in different programmes. Economic aspects should be integrated with management and social components and people should be allowed to determine their priorities. External agencies should attempt to facilitate without creating dependency.

The transport corridor through Central Asia, which more or less overlapped with the silk route, should be developed. Mountain areas in the past were used only for extraction of resources, and this policy should change and focus on the development of mountain people. Efforts were underway to create a Mountain University in Central Asia, but there are many aspects that have to be finalised. It was also mentioned that stronger linkages could be established with the Mountain Forum.

In Kyrgyzstan there have been recent changes in the development strategy owing to the major problems being experienced in different areas – particularly the management and use of natural resources. There are also new experiences in working with the local people. Poverty and lack of funds had a negative effect on the environment.

Families from a poverty-stricken area of the Ningxia Plains were resettled in another area in Go Hai. In the new area people were provided with better facilities and services, and farming was promoted using improved practices and ecological considerations. After a decade the programme has been considered successful because of its favourable impact on the economy, ecology, and social aspects.

In Kyrgyzstan environmental laws had their beginnings in the 1920s and were focussed on the use of natural resources by public sector organizations. As private ownership was abolished, laws to

govern the private sector — including litigation, appeal, and penalties — have been the most difficult areas to develop. Continuing dialogue is important. It was also important to note that a highly vigorous scientific system might be neither

practical nor feasible.

In Northern Pakistan, promoting community development with very little outside support, focussing on small-scale activities, developing community groups, and supporting community-based initiatives has proven successful.



# Financing of Development and Micro-credit

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## **Chaired by:**

Sander G. Tideman, Triodos Bank, The Netherlands

## **Introduction**

Sustainable development requires sustainable funding. Sustainability in funding is achievable when lenders and borrowers are mutually dependent and know each other well. This principle is missing from many large-scale lending programmes of banks and multi-lateral development banks.

The recent currency crisis in Asia can be attributed to the lack of this market interdependency: the so-called short-term 'flash-capital' was abruptly withdrawn by far-way foreign portfolio investors who did so not because of the performance of particular investment companies, but because of a generally negative sentiment in the market about some South East Asian Tiger economies.

Certainly a degree of large-scale central funding is still required, specifically to fund those sectors of the economy and society that do not have access to capital markets easily (such as remote mountain communities).

In terms of sustainability most development is to be expected from the efforts to set up micro-finance schemes in which small ('micro') loans are given to, e.g., individuals, households, thrift societies, small enterprises, and NGOs, usually without demanding collateral except for a group guarantee.

In the last decade, micro-finance has proven to be a very effective instrument to raise the incomes of local grass roots' communities, while high repayment rates have created financially sustainable lending programmes. Success stories of Micro Finance Institutions (MFIs), such as those of the *Grameen* Bank in Bangladesh and the *Banco-sol* in Bolivia, are now followed throughout the develop-

ing world. Central Asia is also experimenting in this field; e.g., through the Mercy Corps which supports programmes in Kazakhstan, Kyrgyzstan, and Tadzhikstan; a joint Chinese-Canadian initiative in Xinjiang; the Peak Enterprise Programme of the Mountain Institute in Tibet; and Micro-Start of the UNDP in Afghanistan, Mongolia, and Kyrgyzstan. ADB has invested in micro-credit institutions in Nepal and China.

Clearly, with any credit scheme, the loan recovery rate is a critical factor. Often there are problems with loan repayments. This determines the viability and sustainability of a scheme.

Factors to be considered when establishing credit programmes include the following.

- ▶ A legal structure is needed to regulate MFIs, including NGOs, credit unions, and public trust funds.
- ▶ Cost of operations — Sustainable credit systems not only need to cover costs of operations (overheads) but also non-recovered loans and inflation.
- ▶ Organizational structure — Should the credit be provided to individuals or through private farmers' associations?
- ▶ Governmental role — Should the government be involved and compete with private enterprises?
- ▶ Social values and lack of economic understanding can undermine a credit system. Credit recipients of donor grant programmes are sometimes confused about the difference between credit and grants.

A big obstacle to credit supply in countries under a socialist regime is that land is a communal or state property. The farmers only have users' rights to the land and no title deeds. Thus, the land cannot serve as collateral for a credit supplier, which makes the acquisition of credit very difficult.

Therefore, in the countries belonging to the CIS it is of utmost importance that laws on privatisation of land are passed by their governments. This will support agriculture, as it will not only allow the farmers to get credit, but they will also be more eager to invest in their own land.

As soon as the farmers (and other entrepreneurs) possess title deeds on their estates, banks should have no problem in starting credit schemes.

It is also recommended that central governments, such as the Chinese, free the fixed interest rates now monopolised by state banks. Without flexible interest rates there is no incentive for micro-credit programmes and those that do start are prevented from becoming financially sustainable organizations. Higher interest rates do not mean exploiting the poor, but rather it is a way to achieve efficiency and to stimulate capital flows to farmers and small-scale enterprises in the rural sector.

### **Major Issues and Experiences**

#### **MICRO-FINANCE IN CHINA: A XINJIANG CASE STUDY** **Sue Carey**

*Canadian Cooperation Association*

The Canadian Cooperation Association is the executing agency for the Canadian International Development Agency (CIDA) for the Xinjiang project. This project was designed in October 1996 and attempted to take the best aspects from a variety of micro-finance projects and integrate them into a project that was both financially and operationally sustainable. The project has now been successfully tested for about a year and a half.

Banking for the poor is a concept that has been around for a very long time and which has been operationalised un-

der a variety of names such as village banks, credit cooperatives, revolving loan funds, pre-credit units, and, more recently, micro-finance. One of the better known is the *Grameen Bank* in Bangladesh, created by M. Yunus, which is engaged in commercial lending to poorer groups.

The Xinjiang project, which focussed on providing women with access to credit, training, and other inputs for improving their economic opportunities, operates at a level between that of a village bank and a credit union. The priorities are to ensure sustainability through independence and beneficiary control of activities, a grass roots' approach, and permanent access to credit. The last point is important because most projects think only of the short run. In order to ensure sustainability of the activities, mechanisms had to be envisaged that ensure the project continues long after external support has gone.

An important component of sustainability was the mobilisation of savings and a certain loan to saving ratio was maintained that was altered from one cycle to another. Two kinds of savings' accounts were maintained with funds split between the two. The regular savings' account permitted members to deposit and withdraw funds while the share accounts had funds locked in for certain periods before one could withdraw, even if one did not participate in the programme. A 20 per cent interest rate was charged on all loans. The concept of a village centre development fund to be supported from a part of the interest payments was also introduced for investment in a community type development project.

Initially, credit was provided for a period of six months to all because a longer time period implied greater risks for the loans. The model adapted different components from both the *Grameen Bank* and P-28 of UNDP and established soli-

arity groups formed by a membership of seven to 10 persons. Each individual was responsible not only for his/her loan but also for the loan of the other individuals in the group.

The repayment rates since the project started have been one hundred per cent. In the first cycle the loan savings ratio was 10 to one and this became eight to one in the second cycle, six to one in the third cycle, and four to one in the fourth cycle. The maximum amount was limited to 2,000 RNB, and the future of the project will need to address how to increase the size of loans. A minimum monthly payment cycle is also enforced. Some of the interest incomes are also forwarded to the county government.

One of the important challenges so far has been to motivate people considered backward to come forward and participate in these activities, learning how to run their own business organization, to keep records, and make decisions. The project has also organized training and study tours to other groups.

Initially it was difficult to choose the right target group, and experience underscores the importance of a proper baseline survey so that the most needy households are selected. Working with women members in certain types of communities must be approached carefully. At present, all the participants are women with the average age being from 45-50 and ranging from 18 to 75. There are no restrictions on adult participation.

The formation of solidarity groups is left to the members who send representatives to the management committee. There is also a county project office and its staff members are paid by the county. The field offices are being supported by the project but will also be supported by the county soon. The role of the field officer is very important because he/she is both the motivator and the technical

person that helps six to 10 groups at any time.

The training programmes have attempted to develop confidence among the people. As far as possible technical knowhow has been sourced at the grass roots and tailor-made for specific needs. It is sensitive to culture and gender and interactive delivery methods have been used. It has also tried to be responsive to evaluation and feedback. The areas of training have focussed on micro-enterprise business management, financial management, literacy, numerical skills, health care, gender, and cooperative development with the full participation of husbands and professional development for staff. Support has been provided to the county project office so that it can be effective in planning, monitoring, and evaluating in the future. A computerised financial information system has been put in place that provides membership information and project performance data that can be readily recovered.

During 1997/1998 there were over a thousand members in 28 groups in 14 villages. The loans disbursed were above US\$145,000 and savings were US\$34,500. Marketing funds were also obtained from Beijing for one-third of the group, although a small interest is being paid on the amount received. In future, the plans are to expand membership groups and loans, generate more savings, and start a women in development centre with a priority on medical services and a cooperative health plan. So far the project has been very encouraging and, as it expands, new challenges are expected with an increasing role for the local people in solving their own problems.

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\* Currently there are 8.26 RMB to the US dollar.

**MICRO-CREDIT FOR THE  
POOR OF CHINA**  
**Sun Ruo Mei**

*Chinese Academy of Social Sciences,  
China*

The micro-credit pilot project started in 1994 and was implemented by a unit of the Chinese Academy of Social Sciences. It was an action research project attempting to replicate the *Grameen* Model approach for poverty alleviation in China. This was in response to the conditions prevailing: poor households lacked access to credit, most poverty-related loans had very low repayment rates, and it was generally believed that poverty alleviation activities could not be carried out with loans from financial organizations.

The main objectives were to provide loans to poor farmers, demonstrate that loans could be repaid, and cover 1,500-2,000 poor households in the next two to five years. The project received funds through a technical grant from the Ford Foundation, the Australian International Development Agency, and from Canada.

The operational system consisted of a head office and country office with a great deal of independence given to the county office. The local government provided full support. The target was to reach poor households and poor women specifically. There were three sizes of loans of \*RMB 1,000, 1,500 and 2,000. The interest rate was eight per cent and repayment after three weeks' grace was in weekly installments. Solidarity groups consisted of five members in each group. Four to five groups got together to establish one centre where weekly meetings were held to discuss weekly repay-

ments and other issues in the group. Savings were also considered part of the group funds and weekly savings expected from each individual were of RMB one each.

So far four branches have been established in the three Provinces of Heibei, Hunan, and Shanghai with 5,668 borrowers.

The total loan was US\$ 1.5 million while the outstanding loan was US\$550,000. The repayment rate was 98 per cent.

Regarding the impact on poor households, the average profit rate was 144 per cent, while for farming and animal husbandry it was 107 per cent, and almost 94 per cent for small businesses. Three of the branches have achieved operational sustainability in terms of being able to support all their costs from the interest payments. The other impact has been the extension of this model for poverty alleviation by the two hundred other county governments in 10 different provinces. By the end of 1997, about RMB 100 million was being provided under this scheme.

**THE ASIAN DEVELOPMENT BANK'S  
COMMITMENT TO SUSTAINABLE DEVELOPMENT IN CENTRAL ASIA**

**Dr. Joseph A. Weinstock**

*Senior Sector Specialist  
Office of Environment and Social  
Development  
Asian Development Bank*

Sustainable development is an important issue for every country in the world, be they established industrial, new industrialising, or predominantly agrarian countries. All share the same global resources of air, water, and land, so unsustainable development in one country often effects other countries. This is particularly evident when such activities generate transnational pollution such as atmospheric smoke and airborne

particulates, or water-borne pollution in our oceans and seas.

For the newly industrialised countries, it is particularly important to keep sustainable development in the forefront of development planning. All too often, in striving for rapid economic growth, the Bank's Developing Member Countries (DMCs) have industrialised using inefficient and unsustainable technologies rather than planning for sustainable development. The result has been costly not only in terms of a degraded physical environment, which must be later cleaned up, but also in terms of the declining health standards and quality of life caused by pollution.

The United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro, Brazil, in June 1992, provided guideposts to humanity leading to equitable and sustainable development in the 21st century. Sustainable Development was defined in 1987 by the World Commission on Environment and Development as a process in which the exploitation of resources, the direction of investment, and the orientation of technological development and institutional change meet the needs of the present generation without compromising the ability of future generations to meet their own needs.

The Bank, recognising its important role in promoting sustainable development, was represented by its President at this historic event. The broad goals of UNCED were laid out in the 40-chapter plan known as Agenda 21, or the action programme for implementing the principles enunciated in the Rio Declaration, or 'Earth Charter', which resulted from UNCED. After a review of the Bank's environmental and social development programmes and activities in comparison to the recommendations in Agenda 21, the Bank adopted measures to ensure sustainable growth in the region. As a first step, the Bank outlined a strategic



framework for environmental action, taking due account of the Bank's Medium-Term Strategic Framework and the UNCED recommendations relevant to its operations. This was formulated in the volume, *'Incorporating the UNCED Agenda, in the Bank's Strategic Planning Process'*, issued by the President's Office in December 1993.

In keeping with its mandate, as well as to prevent overlapping with the work of other international development agencies, the Bank has concentrated on financing specific aspects of sustainable development as outlined by the Agenda 21 action plan. Among others, Bank activities have included poverty reduction; protection and promotion of human health; integration of environment and development in decision-making; promotion of sustainable agriculture and rural development; protection of the atmosphere; conservation of biodiversity; transfer of environmentally sound technology; cooperation and capacity building; combatting deforestation; and protection of the quality and supply of fresh water resources. Not covered by the Bank have been Agenda 21 items such as the safe and environmentally sound management of radioactive waste.

The Asian Development Bank provides several types of financing for sustainable development projects. These include both loans for investment projects and grant funded projects. The poorest Developing Member Countries (DMCs) have access to Asian Development Fund (ADF) financing. The ADF provides long-term investment project financing at concessional rates; typically with a nominal one per cent per annum interest rate. For other DMCs, investment project financing is provided from the Bank's Ordinary Capital Resources (OCR). OCR loans are provided at the Bank's market interest rates, which are still considerably below those that would have to be paid for borrowing money from private commercial banks.

The Bank provides a variety of Technical Assistance (TA) projects which are financed by grants. Generally small, these may be to prepare for a later loan-financed project, or they may be to provide advisory assistance for institutional capacity building. Regional Technical Assistance (RETA) is provided also by the Bank to foster cooperation among several DMCs facing a common issue such as air pollution, a shared resource such as a watershed, or cross-cutting concerns such as poverty alleviation.

In addressing sustainable development in the new Central Asian DMCs, the Bank is focussing on: mitigation of the high cost of transition, capacity building in environmental management, energy and agricultural policy reform, and restructuring of water resources in the context of irrigation and agricultural projects.

To promote sustainable development, the Bank has actively supported regional/subregional cooperation among its DMCs. To accomplish this, Bank-financed Regional Technical Assistance (RETA) projects have been provided to help resolve cross-border and regional/subregional issues. Over the years, a number of RETA projects addressing sustainable development have included Central Asian countries.

The individual country projects and Regional Technical Assistance projects are just a sample selection, highlighting some of the ways in which the Bank has promoted sustainable development. Through individual country projects and technical assistance programmes, the Bank continues to assist its DMCs in achieving economic growth through socially and environmentally sound development. Multiple country cooperative efforts have been designed to complement and enhance individual country programmes and specific projects aimed at sustainable growth and development of the Asian Development Bank's Developing Member Countries.

**HPI's MODEL FOR HELPING THE POOR  
IN CHINA**  
**Chen Naxin**

*Heifer Project International, China*

Heifer Project International (HPI) is an ecumenical, non-government and non-profit organization of worldwide prestige. HPI raises funds and livestock in the United States and implements projects aimed at ending hunger and poverty in underdeveloped areas of the world. Since 1944, HPI has implemented projects in more than 110 countries, helping people create better lives for their families and their communities. HPI provides food-producing farm animals and training to needy families in rural areas. In return, each family will pass on the animal offspring and knowledge to others in need. What they pass on is called a gift, like a living loan. The whole process is called 'Passing on the Gift'.

Because of 'Passing on the Gift', HPI's unique model of helping poor and hungry people, HPI has implemented a great number of effective and efficient projects through the living loan cycle. Since 1985, HPI has been implementing the China Programme through the HPI/China Office. For 14 years, HPI/China has developed HPI's model for helping the poor in China. In the HPI/China Programme, 'Passing on the Gift' means not only passing on animals, technology, and experience but also passing on real loans.

Today, HPI/China intends to monetise 'Passing on the Gift', in order to achieve its financial sustainability in the long run. Because of HPI's model, the China programme enables limited-resource farm families to improve the quality of their lives and equips them to assist others. The programme provides opportunities for families to produce, as well as share, food and income from their own resources, and remarkable results have been achieved.

**PROMOTING SUSTAINABLE DEVELOPMENT: THE ROLE OF THE GLOBAL ENVIRONMENT FACILITY**

**Dr. Hemanta R. Mishra**

*Global Environment Facility, Washington*

Constraints for sustainable development emerge from not one but several factors. World population growth is but one of them. Another one is the rapid increase in consumption of fossil fuel – a key factor that impacts the environment and is rising fast not only in industrial countries but also in developing economies.

Likewise, consumption of other resources is also increasing and is foreseen to have severe impacts on development. The worlds' resources that provide food and income to local populations are becoming scarce. In addition, the world is becoming less secure as natural systems are destroyed, species become extinct, and atmospheric pollution keeps rising.

Let us now look at the role of GEF in meeting these challenges. The GEF is a financial mechanism with a very focussed mandate that provides grants to enhance sustainable development.

GEF focusses on four specific areas: (i) Climate Change, (ii) Biodiversity, (iii) International Waters, and (iv) Ozone Layer Depletion. It also supports activities concerned with land degradation. GEF's key role is catalytic. It multiplies the impacts of its grants by raising additional investments from other sources.

By focal areas, 67 per cent of the GEF's funds of over 141 million dollars were for Climate Change projects, followed by 25 per cent in the biodiversity focal area.

Water and Environmental Management in the Aral Sea basin perhaps pose the biggest challenges for the Central Asian Republics of the former Soviet Union in the International Water Focal Area. Yet,

programmes in the Ozone Layer Depletion Focal Area in Central Asia are almost insignificant and limited to the formulation of Country Programmes for the Montreal Protocol.

A key lesson learned from GEF's limited experiences is that sustainable development cannot be attained without environmental security. Environmental security requires the maintenance of an intricate equilibrium between fulfilling human demands and the preservation of natural resources.

At this point, let us revisit the odds and evens for sustainable development. From a global context, the odds against environmental security and sustainable development appear to be overwhelming when you consider the harsh realities of our world.

Recently scientists and practitioners of environmental security, too, have given not ecological but economic justifications for promoting sustainable development. In contrast to the classic economists, the question they ask is: can we afford **NOT TO**, when the services provided by mother nature amount to twice the World's GNP and at least US \$ 3 trillion per annum?

Thus the key question is what is missing? I do not know the answers to these questions, except to say that one of my fellow countrymen from the Himalayan Kingdom of Nepal, once remarked that Sustainable Development Management is no science, but like politics it is an art – an art of the possible.

Let me close by a statement from a distinguished Japanese – an architect of sustainable development, who once remarked “*How people use or abuse en-*

*vironment are expressions of the country's socioeconomic, political and cultural paradigms. Alarmist calls alone by ecologists or environmentalists or NGOs with a crisis mentality will not bring about changes unless the root causes are mitigated.*”

### **Conclusions**

The presentations and the discussions that followed raised the following points.

- ▶ The poor often lack access to credit and the innovations made in providing credit to poor people are performing well and need to be strongly supported. These primarily consist of small loans with group guarantees only, taken for short periods of time at prevailing market rates of interest. They are called by different names and are now commonly known as micro-credit.
- ▶ The support of the local government is very important at all stages of the activity. As poverty reduction is an important goal of the government, this programme helps to address the needs of poorer groups. It is essential to have reliable information so that poor households can be selected.
- ▶ Even the larger regional banks have started to play a major role in this area. However, they also have equally significant roles to play in developing other sectors and areas.
- ▶ There is a major role for the Global Environmental Facility in helping countries of the region deal with some of their environmental problems.
- ▶ In the Central Asian Countries, previously under the former Soviet Union, lack of private ownership of land is an important constraint to providing loans to farmers. This difficulty could be overcome to some extent by following the micro-credit approach.

## Culture and Ecotourism

### **Chaired by:**

Max Haberstroh,  
Tourism Consultant in Kyrgyzstan

### **Introduction**

The countries of Central Asia are once again discovering their rich cultural and religious traditions embracing both Buddhist and Islamic values. While under the former Soviet Union, much of this was pushed into the background. Today, as different countries attempt to establish their identities as independent nations, they are looking into their cultural and religious roots. One might even say there is a cultural renaissance in Central Asia and attempts are being made to integrate the preservation of their culture with the environment and the economy.

There are many valuable lessons from other parts of Central Asia in this respect. Understanding traditional natural resource management systems will help to integrate these with modern management systems. Participatory approaches

to preservation of culture and natural resources have been widely accepted in other parts of the region and could provide valuable guidelines for Central Asia.

Today, there is a global interest in Central Asia because of the region's many unique cultural, historical, and religious characteristics. Opening the floodgates to mass tourism could also be just as unsustainable as the virtual closure seen in the past. Striking a proper balance is essential because, for many people in Central Asia, this could be their only source of survival at a time when economic opportunities are very limited.

### **Major Issues and Experiences**

#### **BUDDHIST AND ISLAMIC VALUES FOR NATURE PROTECTION** *Nancy Nash*

*Buddhist Perception of Nature, Hong Kong*

Many people in the past saw nature as inexhaustibly sustainable. We know now that this is the case only if we care

for it. It is not difficult to forgive the past destruction which resulted from ignorance. Today, however, we have access to more information, and it is essential that we re-examine ethically what we have inherited, what we are responsible for, and what we will pass on to future generations. Clearly, this is a pivotal generation. Global communication is possible, yet confrontation takes place more often than dialogue for peace. Our marvels of science and technology are matched if not outweighed by many current tragedies; and these include human starvation in some parts of the world and extinction of other life forms.

Exploration of outer space takes place at the same time as the earth's oceans, seas, and fresh water areas grow increasingly polluted and their life forms are still largely unknown or misunderstood. Many of the earth's habitats, animals, plants, insects, and even micro-organisms that we know to be rare may not be seen in future generations.

*"We have the capability and a responsibility and we must act before it is too late."*

This is a declaration made by His Holiness the Dalai Lama in 1986 in recognition of UNEP's World Environment Day. That year the theme was 'Peace and the Environment'. His Holiness is one of those world's religious leaders and willing to speak out on a subject that is important to everyone. Fifteen years ago, when I first started working with the Tibetans on promoting ethics using religious teachings and backgrounds as well as cultural traditions to help the environment, I did not know very much about other religious traditions. Since then I have made efforts to study as much as I can. Central Asia embraces both Buddhist and Islamic values. Buddhist values promote peaceful living together with all species.

I looked at the Islamic values first from literature and then I visited Oman and the Sultan of Oman. I was deeply impressed by his leadership. He has incorporated Islamic values into every aspect of life in the Sultanate. The children of Oman, mostly Muslim, know answers to questions about fish, mammals in the sea, birds, reptiles, and even the landscapes of Oman. This reveals that the Omani people are proud to protect their own land through maintaining religious values.

From these two great traditions in the Central Asian region, I realised that, as human beings, we need a corner, or a bigger corner, of spirituality in our actions and ethical concerns for what we plan for the future.

*"The respect human beings bestow on wild beings is a mark of civilisation."*

-- Sultan of Oman.

**INDIGENOUS KNOWLEDGE AND CULTURAL RESOURCES FOR MOUNTAIN DEVELOPMENT AND CONSERVATION**  
**Prof. Pei Shengji**  
*ICIMOD, Nepal*

Mountain systems and arid plains in the Hindu Kush-Himalayas (HKH) and the Central Asian Region are geographically connected and culturally linked in many ways. The transition from centuries of isolation to intense interaction with the outside world over the past decade has been so rapid and abrupt as to completely disintegrate the traditional and ancient natural resource management systems. The development and environmental problems of the HKH and Central Asia transcend national boundaries, since the interaction of highland and lowland extends across physical, biological, and cultural boundaries, and the changes in the environment and economy create a serious impact on indigenous communities in the region.

Sustainable development has been defined as a phenomenon, whereby meeting the needs of the present generation does not jeopardise the ability of future generations to meet their own needs. In mountain communities, one still finds a stronger sense of community and social responsibility than presently experienced in many developed societies where individual rights and freedom take priority. Villages and communities in the mountain areas of China, India, Bhutan, Nepal, Pakistan, and other HKH countries have conserved natural resources in the ecosystems surrounding their habitats over centuries with the help of their lifestyle, religion, and interdependent relationships established with nature.

The challenges that traditional societies in the region are facing in transformation from subsistence economies to market-oriented ones are varied, complex, and difficult. However it is time to understand that traditional natural resource management, traditional as well as cultural values, and their practice in local societies are as important as the need to introduce modern innovative approaches to sustainable development and sustainable livelihoods.

Participatory approaches to natural resource management have been implemented by many agencies in mountain areas of the region. Examples are the community forestry programme in Nepal and the Aga Khan Rural Support Programme (AKRSP) in Pakistan. Joint forest management in the Indian Himalayas, the joint responsibility system for forest management in China, and the participation of local communities in the management of national parks and protected areas in many locations of these regions are good indicators of rural development and facilitation of improvement of living standards.

While methodologies developed for participatory natural resource management,

such as PRA (Participatory Rural Appraisal) and RRA (Rapid Rural Appraisal), were successful; farmer-to-farmer exchange programmes need to be implemented with rural development programmes in order to ensure the local people's active participation. PBM (Participatory Biodiversity Management) has been developed recently for community participation in biodiversity conservation and resource management. In this, local people's participation in conservation schemes and buffer-zone development of protected areas, community forestry, and pasture management must be highlighted in the participatory conservation approach in the region. Culture-based conservation is a long tradition of local communities, plants and animals are closely associated with many social customs and religious rituals of mountain people in the region. Sacred plants, animals, forests, and mountains are common phenomena in the mountain areas of the region. These can be effectively incorporated into modern conservation.

In Chapter 12 of Agenda 21 of UNCED 1992, the following is stated: "*Mountains are highly vulnerable to human and natural ecological imbalance and most successive to all climate changes in the atmosphere. Mountains are a source of key resources. As major ecosystems, they represent the complex and interrelated ecology of our planet. Mountain environments are essential for the survival of the global system.*"

These concerns are common to all mountain ecosystems — including the Himalayas and the Central Asian region.

**EXPERIENCES IN PROMOTING MOUNTAIN TOURISM FOR LOCAL DEVELOPMENT: LESSONS FROM NEPAL**  
**Dr. Pitamber Sharma**  
*ICIMOD, Nepal*

In the last few decades, tourism has emerged as one of the most potentially

important activities in the Hindu Kush-Himalayan (HKH) mountains. As tourists discover the mysteries of the mountains, the policy-makers find that tourism is a means for providing alternative livelihoods and improving the living standards of mountain people. The emphasis is on promoting ecological tourism and exploring avenues for local development and for economic transformation of often remote, inaccessible, and marginalised mountain areas and communities. Mountain tourism can be sustainable only if it contributes to the economic, environmental, and sociocultural development of mountain communities. In the HKH region, Nepal has had a relatively rapid growth in tourism and increasing numbers of tourists visit its rural mountain communities. This growth has improved the economy but resulted in a host of environmental, sociocultural, and economic problems.

Demand for fuelwood generated by tourists is one of the reasons for degradation of forests. The construction of hotels and lodges along trekking routes naturally increases the demand for timber in the villages concerned.

Garbage generated by tourists affects the rural environment due to lack of management along trails and on camping sites, polluting local water resources and springs and rivers. Human waste disposal into rivers and streams by lodge owners directly adds to the burden.

Tourism-related economic opportunities have impacted land use along major trails. Emphasis on fruit and horticultural crops, decline of traditional agricultural practices, and, in some cases, relative neglect of livestock and pasture management activities have been noted. Modern cement and concrete structures gradually replace vernacular architecture and aesthetics associated with traditional villages. Trail degradation and consequent soil erosion, vegetation loss, and slope instability have been noted along

heavily used trails. The main justification for promoting tourism in the mountains is increased income and employment opportunities.

Invariably, the culture of mountain communities reflects a slow process of adaptation and change. The younger generation wishes to emulate the tourists' behaviour and consumption habits. Negative impacts include the decline in local cultural practices and institutions, commercialisation of art, loss of symbolism of cultural events, theft of cultural and religious objects and artifacts, and a thriving black market.

A more serious impact is the increasing social tensions between those benefitting from tourism and those not benefitting, sometimes aggravated to quite serious proportions in some trekking areas in Nepal. Rising inflation, limited economic opportunities for the mass of the poor and lack of mechanisms to facilitate a better distribution of tourism benefits, and discrimination in employment and even in providing lodging add to the woes.

Although the problems associated with mountain tourism have been conspicuous since the 1970s, the responses from the government as well as non-government agencies are relatively recent.

The first lesson is the need for a proactive role to preserve the culture and the environment so that distortion in market forces is minimised in terms of their harmful impacts. Based on careful assessments, systematic approaches to 'opening' and 'promoting' the area should be developed.

Second is the recognition of the role of different stakeholders which include the government, NGOs, the private sector, and the community.

Third is the need for building institutions at the local level in order to be able to deal with the incoming problems.

Fourth is the role of participatory planning covering all aspects of development, sharing of revenues and resources, developing the local economy, and training human resources. There are many experiments in the region that can provide valuable lessons for countries in Central Asia.

**LADAKH AFTER 25 YEARS  
OF TOURISM**  
**Sonam Dawo**

*Ladakh Hill Council, India*

Ladakh constitutes the northern-most part of India in the Trans-Himalayas. Traditionally, the economy of Ladakh was based on subsistence agriculture in the lower areas, animal husbandry—especially in the Changthang area, and trade with Tibet, Sinkiang, and the plains of India. The quality of life was not exactly good. It was a peaceful, although difficult, life. The social and economic system, however, ensured that the rich and poor shared and cared for each other. People were by and large happy and contented.

In 1974, the area south of the Srinagar - Leh road, including the town of Leh, was thrown open to foreign tourists. Starting with the meagre arrival of 527 tourists in 1974, the number swelled every year and in 1988 it touched 25,000; and this included 8,600 domestic tourists. There was a slump in 1990 and 1991 due to disturbances in the Kashmir Valley. During the following years, the numbers picked up again and the average figure has been around 17,000 per year.

Tourism is truly a double-edged sword. It has been no different in Ladakh. Some of the positive and beneficial effects of 25 years of tourism in the region are as follow.

- ▶ The hordes of tourists, these too from the so-called developed west, taking keen and many of them really genu-

ine interest in the art, culture, language, religion, music, architecture, rivers and mountains, and monasteries and mosques have regenerated a sense of pride in past achievements and a degree of cultural resurgence in the region.

- ▶ Another equally important development that followed the entry of tourists into the region was the awareness generated amongst the people of environmental ecology, sustainable development, and the problems of development that the west was facing. The people of Ladakh started thinking and talking about alternatives.

Of the negative impacts, the following, based on experience in Ladakh, need special mention.

- ▶ Environmental degradation is visible along the trekking routes, in mountaineering expedition camps, in the capital town of Leh, and around the important monasteries.
- ▶ Commercialisation of a once subsistence economy has led to changes in traditional values and systems.
- ▶ Music, dance, folklore, and the arts—even religious festivals—are becoming commercialised. These have somehow lost the spontaneity and sanctity so vital for them to remain part of a living heritage. They may become soulless and mechanical like any other commodity on sale to tourists.
- ▶ Demand for souvenirs has generated demands for local handicrafts. There is also an ever-increasing demand for old artifacts, and there have been cases of theft and illegal sale of priceless antiques—including religious icons, scriptures, and statues from the monasteries.
- ▶ Stray cases of drug abuse and other undesirable habits picked up from hippie back-packers by the younger generation have been making the rounds of the gossip mills in Leh Bazaar.



Keeping in mind the fragile mountain ecosystem of the region and based on its carrying capacity, it may become necessary to restrict the number of tourists to a manageable limit.

Innovative alternative programmes, such as rural tourism, eco-tourism, nomadic tourism, winter trekking, rafting, etc, if developed, will also spread the economic benefits to a wider circle of people in the host country.

Last but not least, the people of Ladakh have to preserve its pristine environment and perhaps develop its unique arts and culture, songs and music, and architecture according to its own genius and not allow these to be elbowed out by external and undesirable influences. By retaining its uniqueness, tourism in Ladakh can flourish and remain sustainable.

**KNOCKING ON HEAVEN'S DOOR:  
REVIVAL OF THE SILK ROAD PHILOSOPHY**  
**Max Haberstroh**

*Tourism Consultant in Kyrgyzstan  
Germany*

If tourism development is given a firm spot by the countries in Central Asia, it will become the lever to get people moving within, and into, multi-ethnic and multi-cultural Central Asia. After all, trade along the ancient Eurasian caravan routes and the mutual influence of different ideas have always stimulated pluralism and multicultural lifestyles. Moreover, 'cocooning the customer', which is undeniably suggestive of silk, is about to become a successful method of doing business nowadays - tourism business - along the Great Silk Road. Therefore, a small but active tourism 'platoon' with a common adherence to this ancient 'Silk Road Philosophy' should spread the idea of its revival. This may mean easing entry restrictions into the region as the first major step.

The next important step will be to let the tourism sector grow from the grass roots by permitting hundreds of private initiatives to develop.

Based on Kyrgyzstan's assets, the target groups are trekkers, mountaineers, nature adventures, rafters, equestrians, and photographers. Under the slogan 'Kyrgyzstan - Land of the Tien-Shan', (Tien-Shan means Heavenly Mountains), Kyrgyzstan posits itself as an adventure and special interest travel destination which complements and supplements its neighbours ('architecture' and 'nature') as a natural oasis on the Great Silk Road.

Kyrgyzstan could also benefit from its world famous author and ambassador, Chingis Aitmatov, and its highly reputable president, Askar Akayev, acting as the country's most outstanding promoters of tourism. The government should make use of its embassies and consulates abroad as information offices on basic tourism issues and give more support to the small- and medium-sized private companies.

Today the member companies of our Association appreciate what we have achieved together. The Kyrgyzstan Association of Tour Operators has become the strongest force in Kyrgyzstan's marketing of tourism.

More and more often member companies of our Association participate in tourism fairs in addition to the International Tourism Exchange in Berlin (ITB): marketing activities gave our Kyrgyz partners more trade contacts, led to new entries for Kyrgyzstan in traveller catalogues, to more guests, and (last but not least) to new investments in real estate, furniture, vehicles, and (above all) in personnel.

Our activities are based upon our 'Ecological Marketing Guerilla Strategy'. This means:

- ▶ clean your home first, then invite guests;
- ▶ find your own identity, then clear up your image;
- ▶ plant 'tourism viruses', thus promoting tourism for the grass roots;
- ▶ offer a good service by 'cocooning customers';
- ▶ support small private companies, which act like 'platoons', in order to find and serve niches in adventure and special interest tourism;
- ▶ cooperate with other partners; choose the fittest, promote the willing, consider important authorities, and beware of over sponsoring bureaucrats;
- ▶ promote Eco-tourism (as stipulated in the 'National Eco-tourism Strategy' published in 1994 by the Mexican Secretariat of Tourism in cooperation with the World Conservation Union) by active GREEN GLOBE membership and by cooperation with the Kyrghyzstan Biosphere Reserve; and
- ▶ use metaphors for the definition of ideas.

### **Conclusions**

There seems to be a need for an ethical approach to conservation. Destruction of natural resources results from a lack of respect for the environment. Many people in the past believed, in their ignorance, that the earth's riches were inexhaustible. Today with access to better information, we know that this is not so and we have the capability and the responsibility to act before it is too late.

The Dalai Lama stressed this point in 1986 on the occasion of World Environment Day. It was mentioned that Islam, like Buddhism, shows great respect for nature. Thus, drawing on these two great traditions, we must care for the environment.

The mountain areas of Central Asia and their varied ecosystems are rich not only

in the context of biodiversity but also in cultural diversity. Sadly, this is being lost under the impact of modern development. The international knowledge system and the indigenous knowledge system represent two global, but separate, systems. The latter is based on a holistic approach, rooted in a deep knowledge of the environment. Documentation of this unique knowledge is an urgent task. There are already some initiatives in this respect, e.g., in Nepal and Pakistan. It can have a productive, practical benefit, allowing better use to be made of local resources. Indigenous culture, however, is extremely vulnerable. Active measures are required to protect it. Transitional cultural zones can be used to help integrate traditional culture into modern life. Also, indigenous culture can be used to help in conservation of the environment.

Mountain tourism in the social and cultural context, especially in Nepal, has a cultural competitive advantage. In addition to their dramatic natural beauty, the mountains provide for advantage and challenge. Tourism, moreover, generates a huge amount of employment for the local population. It does, however, entail certain trade-offs. For example, it increases consumption of timber (for firewood and construction) and also results in a vast amount of garbage. But it also has positive effects; stimulating new forms of economic activity. The main conclusion is that tourism must be managed. Nepal has taken some innovative steps in this direction.

The unique flora and fauna of Ladakh in India have attracted growing numbers of tourists since the area was opened to foreigners in 1974. The number of tourists (domestic and overseas) has stabilised at about 17,000 per annum. Eighty per cent of arrivals take place in about 75 days. Efforts should be made to spread this out. There have been positive benefits from tourism, e.g., increased self-confidence of the local population since foreigners began to take their cul-

ture seriously. This has led to a national regeneration. There has also been increased awareness of environmental and development issues. There are now many NGOs working in social and cultural fields. However, there have also been negative effects, e.g., much ecological degradation, commercialisation, criminality -- including thefts of religious objects, and drug abuse. There has not been an overall improvement in the economic situation in the region, merely a growing disparity between the rich and the poor. Again, the conclusion is that tourism must be managed and, if necessary, restricted.

Tourism could be a lever to get people moving into Central Asia. A regional strategy is taking Kyrgyzstan as a core centre. In order to develop tourism, there is a need to cocoon tourists and to understand their needs and hopes. An interesting comparison was made with the tactics and strategy used in warfare, i.e., planning to achieve a particular aim, using mobile and small-scale ('guerilla') groups to this end. Bureacracy must be defeated, frontier delays etc overcome. A grass roots' strategy is the only option in this environment; also a problem-solving approach is needed and the creation of synergies.

# Energy and Other Examples of Sustainable Development

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## **Chaired by:**

Dr. Mahesh Banskota,  
ICIMOD, Nepal

## **Introduction**

The Central Asian Region is abundantly endowed with many different types of energy resources, both renewable and non-renewable. In the past, emphasis was primarily on exploitation of energy resources and not on sustainable use. With increasing recognition of the environmental impacts and degradation of natural resources, the countries of Central Asia are beginning to undertake different measures towards environmental sustainable use of energy resources. This is not, however, feasible without some major changes in the economic activities that are the primary sources of demand for energy. With changes in the economic scene, many adjustments are needed in terms of investments, pricing, and distribution of energy resources. One move towards harnessing renew-

able resources is a new effort that has been encouraging.

The Central Asian Region needs to promote stronger regional cooperation in the area of sustainable use of energy resources. The geography, the past history, and the future needs of the region emphasise the role of regional cooperation as well as specific measures within each of the countries.

## **Major Issues and Experiences**

### **REGIONAL COOPERATION IN THE USE OF WATER AND FUEL AND ENERGY RESOURCES**

**Dr. A Zyrianov**  
*Kyrgyzstan*

The Central Asian Region has significant power resources, such as fuel, located basically in Uzbekistan, Kazakhstan, and Turkmenistan, and hydropower, mostly in mountain and other regions of Kyrgyzstan and Tadzhikistan.

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The stocks of organic and mineral fuel in the region, as well as available water resources, are limited and underscore the necessity of their rational use.

The basic reason limiting cooperation is the aspiration of the republics to avoid dependence on others for power.

With the formation of the independent states, the situation has changed in Central Asia. Since 1991, complications of interstate connections and the introductions of national currencies, rises in prices of petroleum, coal, gas and tariffs for rail transportation, and reduced deliveries of fuel and electricity have affected the fuel and energy balance in the region. At the same time, production of fuel has sharply decreased, forcing households to cut back drastically on the use of energy for heating and even cooking. There are also changes in the seasonal availability of water, giving rise to a complex set of interrelated problems.

The aspiration of each country to use the available energy resources most efficiently, at the same time not creating problems for other countries in the region, makes it necessary to work out plans and programmes for the balanced use of water and other energy resources in the region. The coordinated water and power policies of the republics of Central Asia directed towards joint development and cooperation in use of fuel and energy and water resources are obviously a very high priority for the region.

#### **WIND ENERGY IN XINJIANG** **Lu Feng**

*Xinjiang Wind Generator Factory  
China*

China is comparatively rich in wind energy resources. Two hundred and fifty-three million kW of wind energy are distributed widely from south-east China to Gansu Province. Xinjiang is not only rich in oil but also has a vast potential

for wind and solar energy. This is currently being harnessed and distributed mainly in the northern part of Xinjiang throughout a total area of 150,000sq.km. Forty kilometres from Urumqi City, from an area of 10,600sq.km., two million kW of wind power can be supplied.

The harnessing of wind energy in Xinjiang started in the mid-1980s and the total installed capacity was 196 Megawatt using small generators. In 1986, 100kW wind turbines were installed. In 1989, 13 sets of wind turbines with a capacity of 150kW were imported and installed with Danish grants. Between 1992 and 1995, 33 sets of wind turbines, generating 300kW and 500kW, were imported and the first wind farm was established.

Currently the total capacity of wind turbines has reached 66.3 Megawatts. Wind power has advanced from the testing and demonstration stage to proper usage for Xinjiang's energy-consuming industries.

By 2,000, the planned target for the wind energy generated 150 to 200 Megawatts, and five years hence it is 350 to 400 Megawatts. The estimate is that each year there should be an increase of from 30 to 50 Megawatts. A series of strategies has been made to achieve these targets.

The benefits from wind energy are that it is not harmful to the environment in comparison to other forms of energy; the construction period is short; it is easy to construct and operate, and it is relatively cheaper than other renewable sources.

The Government has made certain laws and regulations to develop wind power in Xinjiang and the country as a whole. However, in order to harness this energy resource effectively a proper overall construction plan should be made by the government.

**MANAGING WATER FOR A SUSTAINABLE ENVIRONMENT**

**G. Shanker Ranganathan**

*Chairman and Managing Director/ Ion Exchange (India) Ltd.  
India*

The interdisciplinary approach to common problems is obviously the best way to deal with them. These problems also require the participation of the communities who will benefit from their solution because the systems finally accepted after discussion are best managed by the communities themselves. Other conditions that are also becoming compelling are low energy use and recycling to avoid pollution and further damage to the ecosystem.

Erosion is the result of inadequate vegetative cover in watershed areas, resulting from agricultural or activities permitting unrestricted grazing of animals or the building of roads and industrial infrastructure. Watershed management could provide significant employment with complementary use of the area for eco-recreation.

Pollution is the result of inadequate waste treatment and can be controlled by proper treatment and recycling. Industrial waste water can be treated and re-used almost totally. Similarly, sewage after proper treatment can be used for irrigating crops and recharging ground and surface water.

At the Water Environment Federation's (WEFTECH) Conferences held in March 1998 in Bombay, Singapore, and Kuala Lumpur, papers were presented that referred to the desirability of using biological processes for treatment of sewage. These are the most economical systems in which the energy requirement is just a fraction of that of mechanised systems requiring aeration. Even chemical oxygen demand (COD) as high as 5,000ppm — including industrial chemicals — can be reduced to less than 200

ppm in five days' retention by the use of lemna, duckweed, and other aquatic plants. Rootzone treatment similarly shows promise. Where much higher COD figures are involved, as in distilleries and breweries, Upflow Aerobic Sludge Blanket or Fixed Film Aerobic Reactors followed by the natural systems referred to above could be considered.

**SOLAR ENERGY IN XINJIANG PROVINCE**  
**Li Shou,**

*Shell Company, China*

The representative of Shell Company began by notifying the audience about the series of products they had displayed. Then, focussing on Xinjiang, he pointed out that the Province is rich in energy resources such as natural gas, solar, and wind energy. He added that Xinjiang's solar energy was unique. The region's solar energy radiation amounted to a total of 5.8 x 10<sup>16</sup> joules, which is 10 to 15 per cent more than in other regions at the same latitude. Xinjiang stands second in terms of solar energy resources in China; 2,500 to 3,500 hours annually. The potential market for solar energy in Xinjiang is underdeveloped.

Owing to poverty, remoteness, and dispersed settlements, not many have access nor can they afford electricity. Using public grids is neither economical nor efficient. Therefore, against such a background, it is better to use wind and solar energy as they adapt better to local conditions.

The Solar Energy Institute, which has been set up in Xinjiang, has carried out research on energy options and has been awarded 10 prizes already. In the context of solar energy products, solar heaters and household power sources have been well received by the public. The institute is interested in joining hands with others wanting to produce solar energy-based products in institutional ex-

change programmes. Some of the first products were produced in collaboration with France and included the solar energy pump system and batteries. Later, in 1996, Holland assisted in initiating the 'Bright Project' in Xinjiang. Besides active participation in the project, the institute has also made attempts to popularise solar energy systems at the household level.

**SUSTAINABLE AGRICULTURAL DEVELOPMENT AND ENVIRONMENTAL PROTECTION IN XINJIANG**  
**Wang Yongxing**  
*Xinjiang Institute of Ecology and Geography, China*

Lying in the centre of the EuraAsian continent, Xinjiang is characterised by an arid climate and wide distribution of deserts. The land is sparsely populated in the oasis which covers a relatively small area and is surrounded by desert. As a land with a long history of civilisation, agriculture plays the most important role in productive activities, along with the development of water and land use in the region. This creates heavy pressure on the fragile environment. With rich natural resources, Xinjiang has been determined as an important development area for China in the next century. The development of agriculture will reach a new level, as will the pressure on the environment. The development and protection of the environment are keys to the sustainable development of agriculture in Xinjiang.

In Xinjiang, agricultural development was achieved by expanding the area of cultivated land before the 1980s. The development of agriculture in Xinjiang can be divided into five main stages.

**The Period of the Qing Dynasty to Minggu** - The first era of large-scale land development was introduced in this period. The production of agriculture was not stable in this period because of continued wars.

**1949-1957** - The area of cultivated land was expanded continually in the early period of the new-founded China and many state-run farms were set up in this period.

**1958-1967** - This was a special period for the development of agriculture in Xinjiang. The area of cultivated land reached its highest level in 1963. However most of the land did not show increasing productivity.

**1968-1995** - Sub-stage one (1968-1976): This was the period of the so-called cultural revolution. Agricultural production decreased rapidly, the area of cultivated land decreased by about six per cent compared to 1967, and the productivity decreased by seven per cent.

**Sub-stage Two (1977-1995)** - This was a period of increased production and efficiency. On the one hand, the policy of reforms aroused the enthusiasm of the farmers and, on the other hand, the improvement in agricultural techniques and the construction of the windbreak forest system supported agriculture effectively.

Although agriculture has developed greatly in Xinjiang to feed the increasing population, its continued expansion has brought about many environmental problems. Among the main problems are desertification, salinisation, and degradation of the land. Balanced use of water resources so that they are not all used for irrigation, controlling overuse of grasslands, and better understanding of the oasis environment are some of the important priorities for the future.

Recently, more and more people in Xinjiang have begun to understand the importance of environmental protection as well as the role of balanced use of water and land resources. Environmental protection is now a part of the government's long-term plan, and the legal

system related to environmental protection is also being completed.

**PRINCIPLES OF SUSTAINABLE USE OF  
BIODIVERSITY**

**Dr. L. Shabanova, Dr. K.  
Karibeava, and V. Lysenko**

*National Environment Centre, Kazakhstan*

The strategy of sustainable and balanced use of biodiversity is based on the principles of the Agenda for the 21<sup>st</sup> Century. This new global policy direction has become the basis for development of the national strategy and plans of action and the ideology behind the reforms. It is focussed on the search for non-traditional approaches to improving the well-being of the people and a deepening of cooperation for the achievement of regional ecological safety based on global flows of material and intellectual resources.

The Republic of Kazakhstan has adopted the general principles of sustainable development outlined by the World Commission on Environment and Development. It has emphasised the importance of protecting nature in all international contracts in the country. It has established the Ministry of Ecology and Natural Resources for necessary coordination in the control, regulation, and use of environmental and biological resources. In order to conserve the biological diversity of the country, it has introduced adequate provisions in all aspects of investment, trade, technology, and prices. While identifying the permitted thresholds for influencing the environment, it has also maintained that the responsibility lies with the users of natural resources for alterations in the condition of the environment and for transboundary pollution. Many manda-

tory, ecological sanitary-epidemiological examinations of projects, products, and programmes have been introduced. Proper economic accounting methods, along with appropriate databases and monitoring, are also being developed. The basic purpose behind all these measures is conservation of the environment and strengthening of the natural resource potential of the Republic, as well as maintaining a balanced use of resources and a safe environment.

**Conclusions**

The presentations and the discussion that followed raised the following points.

- ▶ Economic changes have severely affected the availability of energy inputs and households are experiencing great difficulties in accessing energy resources even for their day to day needs.
- ▶ Increased regional cooperation is needed for balanced use of energy resources and the management of transboundary pollution.
- ▶ Xinjiang has made substantial progress in developing the capacity to harness wind energy, and other countries could benefit from this development as well as from their experiences.
- ▶ Energy is a derived demand and consequently without changes in economic activities there would be little change in the use of energy resources or in environmental impacts. In the selection of economic activities and choice of technology, more emphasis on sustainable methods is needed.
- ▶ Energy resources cannot be seen in isolation and need to be reviewed in the context of the country's development; including regional and international considerations.





# Regional Cooperation for Sustainable Development

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## **Chaired by:**

Branko Bosnjakovic, UN-Economic Commission for Europe

## **Introduction**

The movement of surface water and pollution of air or water and transportation routes are not generally limited by state boundaries.

The division of (river) water can be important for irrigation of crops, for the generation of hydropower, and, finally, for the possibility of shipping. In addition, building dams can have serious repercussions downstream, affecting both shipping and fishing, and may cause erosion in the river valleys. Upstream, considerable areas of fertile agricultural lands in the valley will have to be abandoned because of flooding.

Since water is such a vital resource in arid Central Asia, conflicts of interest over the use of water between countries

easily arise. Tensions between the water suppliers upstream and the water users downstream are already evident. Such tensions are well illustrated elsewhere in the world: between Turkey and Syria on the use of water from the Euphrates River and between Austria and Hungary on the use of Danube water.

In such cases, only a process of inter-regional consultation and negotiations about improving the efficiency of water use and long-term sustainability of the water management system can avoid severe conflicts in the region. A future 'war on water' in Central Asia is not imminent, but also not to be excluded, as much of human livelihood is dependent on the availability of water resources and shared access to them.

Pollution is exported across borders through the air and by water (both surface and sub-surface water). Clearly, such transboundary pollution issues have regional security implications and,

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not surprisingly, many projects given top priority are addressing just those problems. Pollution by river water can best be controlled in the framework of a regional water quality management strategy.

Some papers state that, for a landlocked region such as that of Central Asia, the only way to open up to economic development is the construction of highways. Once that is done, both private and government projects develop almost automatically along such an artery. This was very well shown on, for instance, the island of Sumatra in Indonesia after construction of the Trans-Sumatran Highway. Farmers settled by themselves and government settlement projects were situated along the road. The inherent disadvantage, obviously, was the disappearance of the tropical rain forest!

Road construction will have similar dangers for Central Asia, so some other papers are very critical of opening up unspoiled natural areas to transport infrastructure. Not only will the environment be threatened, but also local communities could well be disrupted. If communities lose the connection to the land and home villages, this will cause many to leave for the seemingly more wealthy urban areas, ultimately ending up in urban slums. This will also lead to loss of the cultural self-esteem that was derived from the relationship with local land.

Still, voluntary access to outside areas should be encouraged. The arbitrary delineation of state boundaries in the former USSR leads to isolation of mountain regions; regions which in the past were accessible by caravan trade routes. In the current economic and political crises, these regions suffer from intricate conflicts over power between local leaders. One of the most serious cases is to be found in the Pamir Mountains. Here, in the eastern part of Tadzhikistan and South-eastern part of Kyrgyzstan, some peripheral, underdeveloped mountain

areas are situated. Their situation is the result of various factors.

- ▶ Remoteness of these mountain territories and the resulting efforts of local leaders to gain greater autonomy
- ▶ Conservatism of the local population, which is a general feature of mountain communities
- ▶ Discriminative social and migration policies of the central government
- ▶ No investment by the central government in the economic development of such areas

Some examples of inter-regional cooperation exist already.

- ▶ In the field of water and pollution the five CIS countries in Central Asia: Kazakhstan, Uzbekistan, Kyrgyzstan, Turkmenistan, and Tadzhikistan decided to tackle the Aral Sea crisis and set up the Interstate Council for the Aral Sea (ICAS) in 1992. An agreement was signed for cooperation on management and use and protection of water resources in the Aral Sea catchment area. All major donor organizations gave help, and this was coordinated by the World Bank in the Aral Sea Programme (ASP).
- ▶ One of the projects implemented within the framework of the ASP is the 'Aral Sea Wetland Restoration Project' (ASWRP).
- ▶ As for inter-regional roads and railways, some were actually constructed (or improved) and other stretches have been proposed.
- ▶ The routes that were actually realised, in order to connect the CIS states with the outer world, some of them in the framework of the TRACECA Programme for an Euro-Asian transcontinental highway, comprise of
  - autoroad Chorgos (Kazakhstan) - Kulja (China),
  - autoroad Bishkek - Turugart (Kyrgyzstan) - Kasgar (China) - Karakorum Highway,
  - autoroad Osh - Sary-Tash (Kyrgyzstan) - Kasgar (China) - Karakoram Highway, and

- railroad Tajan (Turkmenistan) - Mashdad (Iran),
- none of these routes embrace the Pamir region.

In addition, the Russian Academy of Sciences prepared a proposal to open a transportation corridor from Dushanbe (Tadzhikistan) to Sary-Tash in Kyrgyzstan and onward to Kasgar into China. Such a corridor has the following advantages.

- ▶ It will support integration of the marginal, peripheral, and underdeveloped mountain areas, such as Karateghin in Eastern Tadzhikistan, into the general development of Central Asia.
- ▶ The system can operate almost all year: as far as Sary-Tash there are no high passes or inaccessible sections, while the passes in China are open 11 months a year.
- ▶ Only a few sections of the 750km long stretch from Dushanbe to Kashgar are currently not metalled.

Implementation of this project may prove beneficial in the following aspects:

- ▶ Politically: It will require the political will of the countries involved and these are Tadzhikistan, Kyrgyzstan and China, which are all signatories to the Pamir Convention.
- ▶ Economically: The corridor may be viewed as a catalyst of the economic and social development of the adjacent regions.
- ▶ Socially: The zone along the corridor is inhabited by numerous nations and ethnic groups: Tajiks, Kyrgyz, Kazakhs, Uigur, etc.
- ▶ Environmentally: The magnificent beauty of the mountain ranges and depressions opens up great possibilities for development of protected territories, national parks, and tourism. Already, in the late 1980s, the Ministry of Environment of Tadzhikistan developed a proposal for the 'Pamir Nature Park'.

As the region has the joint features that it is fairly isolated with very limited water resources while it has considerable environmental problems, regional cooperation is equally important to all countries in the region and, therefore, should be promoted by them. Development is certainly not facilitated by tension and, therefore, it is better to avoid conflict through cooperation.

It is suggested that the development of infrastructure, such as highways and rail-links, which will inevitably take place, goes hand in hand with planning for protected nature reserves. Here, eco-tourism could bring benefit to improvements in living standards and protection of nature. Without such a connection, highways could lead to one-sided exploitation and depletion of forests and other natural resources, which anyway would not automatically lead to income-generation for remote mountain communities. If regions are opened up, a clear policy should be developed to stimulate local, economic activities that empower the local community and not just far-way urban elites.

These efforts could be developed across borders, e.g., by setting up frontier border parks accessible to eco-tourists who adequately compensate the mountain communities for their custody of natural resources.

### **Major Issues and Experiences**

#### **SUSTAINABLE DEVELOPMENT AT THE REGIONAL LEVEL: UN ECONOMIC COMMISSION FOR EUROPE POLICY AND LEGAL INSTRUMENTS** **Branko Bosnjakovic**

*Regional Advisor on Environment, UN Commission for Europe, Geneva, Switzerland*

Five Central Asian states are members of the UN Economic Commission for Europe (ECE). The promotion of sustainable development is a guiding principle

for all relevant activities of the ECE. The ECE has developed a number of instruments and policies of key significance for environment, transport, trade, energy, and industry. In the context of sustainable development in a liberalised and competitive world economy, the transboundary environmental policies and instruments at the regional level are of paramount importance. It is necessary to understand the ECE conventions concerning the transboundary issues of air pollution, water protection and management, environmental impact assessment, and industrial accidents. The newly adopted Convention on Access to Information, Public Participation in Decision-making, and Access to Justice in Environmental Matters are also important. The potential role and applicability of these conventions in Central Asia need to be looked into.

#### **MONGOLIA AS A BRIDGE FOR CENTRAL ASIA**

**Mr. Nyamtseren**

*Development Foundation, Mongolia*

The current conference is being held at a historic time. Many areas in the world have already successfully engaged in regional cooperation initiatives as a complement to globalisation, and humanity is planning its future in the 21st century and preparing for entry into the new millennium.

The Mongolian Government is committed to establishing its own position in regional cooperation externally and domestically through strong policies for macro-economic stabilisation and structural reforms. It will also undertake decisive steps to facilitate transition and reform processes, as well as accelerating economic growth towards sustainable development in the 21st Century.

The Action Programme of the Government defines its strategic objectives as: to occupy its own place in the development of the region, to pursue an active

policy, and to develop mutually-beneficial relations with the countries of Central Asia as well as with those of the Asia and the Pacific region.

It will also pursue complementary innovations in domestic economic policy and legislation and give priority to developing bilateral and multilateral relations with the countries of the region.

In the foreign policy programme of Mongolia, it is stated that “*Mongolia will exert efforts to strengthen its position in Asia and to take part constructively and appropriately in political and economic integration in the region.*” Within the framework of these goals, Mongolia will give priorities to the sub-regions of North East Asia and Central Asia.

The geographic situation of Mongolia allows it to act as a bridge between Central Asia and North East Asia. The regional development of the country and the intensification of its infrastructure, especially the energy sector, communications, roads, and transport, shall be the first priorities. During the previous period, changes occurred in all spheres - political, economic, and social. The government of Mongolia continues to focus on the policies for private sector promotion, economic stabilisation, reduction in public enterprises in the economy, and a general increase in the living standards of the population.

Overall, the aim is to move towards sustainable development to enable economic growth through promotion of the private sector and provision of infrastructure. The economic reforms and innovations in mountain areas coincide with principles of people-oriented, equally distributed, and environmentally-zoned sustainable development — despite current economic hardships and other difficulties encountered during the transition period. It is also understood that sustainable development cannot be achieved without political and economic

stability and a well-balanced economic and environmental approach. The government has applied for the inclusion of 49 million square hectares of Mongolian land in the world's special protected areas.

Mongolia has a dry continental climate. Environmental degradation and global warming have caused serious environmental and ecological problems. The surveys carried out in the last 50 years show that the climate has become 0.7 degrees warmer. Drought occurs every two to three years, the water levels of large rivers have decreased by 20 to 30 per cent. One-third of the pastures and arable lands are degraded and there has been a loss in land fertility of 20 to 30 per cent. It is obvious that there has been a reduction in biodiversity. Resolving such global problems requires multilateral and joint action from all countries worldwide. Coordinated measures have to be taken in this respect. From this point of view the current conference is of great significance. While we do our best to resolve our problems, we seek cooperation from the Northeast, Central Asia, and the Southeast to resolve common problems. The Mongolian Government is planning to implement the 'Mongolian Action Programme for the 21st Century'. Our National Council for Sustainable Development was established in August 1996 to oversee the implementation of these development strategies.

There are many challenges and problems for which decisive action and a comprehensive approach are required. In this regard, I would like to emphasise regional cooperation in Central Asia. The progress in regional cooperation in Central Asia is relatively slow. Cooperation has to deal not only with issues of environmental and local and national problems but also with all complex and common problems, focussing on all countries in the region. Therefore, my suggestions to CoDoCA are as follow.

- ▶ To move and promote more practical activities such as carrying out studies on opportunities, challenges, and complementarities of economic cooperation in the region
- ▶ To promote positive contributions of participating countries on resolution of cross-border environmental and other problems, giving priority to infrastructural development which is vital for linking the region and for creating a favourable trade and investment climate
- ▶ The development of appropriate strategies and programmes for regional cooperation
- ▶ The building of institutions for regional cooperation such as the establishment of an inter-governmental body
- ▶ Cooperation with international financing organizations and partnerships with the private sector
- ▶ Establishment of regional development facilities or facilities for investment cooperation in South Asia
- ▶ Facilitating commercial relationships among the participating countries of the region

With the right approach and a multi-country team effort, we can step up the pace of progress considerably. It is up to us to chart out a course of action that can usher in a new era of economically, socially, and environmentally balanced development: development that will leave our planet with a safe and better environment for the benefit of future generations.

**THE ALTAI CONVENTION: THE TOOL FOR SUSTAINABLE DEVELOPMENT OF THE MOUNTAIN AREAS IN RUSSIA, CHINA, KAZAKHSTAN AND MONGOLIA**  
**Dr. Yuri Badenkov,**  
**Dr. V. Manishev, V. Sabin and**  
**V. Reviakin**  
*Altai Republic, Russia*

The Working Meeting of the representatives of the Altai and Sayans mountain

regions took place in Gorno-Altai (Republic of Altai), on April 25 and 26, 1997. The meeting was, essentially, devoted to consultations on the issues of the status of the region's mountain areas and to formulation of recommendations in support of their sustainable development. The consultations were personally participated in by Ministers of Environment and Members of Parliament from the Republics of Altai, Tuva, and Northern Ossetia-Alania, as well as representatives from the Russian Academy of Sciences and the universities. The main topic was preparation of the Altai Sayans Convention on Sustainable Development of the Region's Mountain Areas. It was decided to begin working consultations with the governments of the region, including Mongolia, Kazakhstan, China, and the regional representatives from Russia: the Republics of Altai, Buriatia, Tuva, Hakassia, Altai, and Krasnoyarsk Krays, Irkutsk, and from the Kemerovo Regions.

Taking into account the current status, the increasing role in the 21st century of the mountain regions of Central Asia and Altai in particular, and the goals of the Urumqi Conference, the following actions were suggested.

- ▶ Beginning of real work aiming at development of a coordinated policy for sustainable development of mountain areas in the regional states: Kazakhstan, China, Mongolia, and Russia, on the basis of the Inter-governmental Convention.
- ▶ Starting multilateral and bilateral consultations for compilation of the concept, structure, and statutes of the Convention and for its separate Chapters (Protocols).
- ▶ Establishment of an *ad hoc* working group for preparation of the Altai Convention and a proposal that this work be supervised by Ministers of Environmental Protection of the Xinjiang Province of China, Baian

Ulgii Aimak of Mongolia, East Kazakhstan Region of Kazakhstan, and Republic of Altai, Russian Federation.

- ▶ Request that the Government of Switzerland and other organizations, such as a member state of the Alpine Convention, provide support in the form of consultations and financial assistance to the international working group for development of the Altai Convention.
- ▶ Consider as a priority (Protocol) of the Altai Convention, coordination of nature conservation activities and development of a system of special transfrontier protected territories (nature reserves, national parks, etc).

#### **PROSPECTIVES OF ECONOMIC COOPERATION BETWEEN STATES OF THE CENTRAL-ASIAN ECONOMIC COMMUNITY (CAEC)**

**Dr. N. Aitmurzaev**

*CAEC, Executive Committee*

*Interstate Council for Kazakhstan,*

*Kyrgyzstan, Tadjikistan and Uzbekistan*

The Presidents of the Republic of Kazakhstan, the Kyrgyz Republic, and the Republic of Uzbekistan, expressing the will of their peoples, with the purpose of retaining trade and economic relations, shaping and providing favourable conditions for economic development of the countries and region as a whole, have signed the Treaty for establishment of an integrated economic area on the territories of three states in April 1994.

Geopolitical disposition, common boundaries, a good level of economic relations, availability of transport and other communications linking the states of the region, and the rich natural and raw resources create the prerequisites for economic integration. Naturally, the states of Central Asia represent a uniform ecological system.

It was defined in the Treaty that an integrated economic space is established with the purpose of realising joint programmes to deepen economic integration between the participant states, assuming free movement of goods, services, capital, and labour forces, and ensuring agreed credit and accounting, budget, tax, price, customs, and currency policies.

For development of the common approaches and directions of cooperation in economic, political, defensive, and humanitarian areas, the following of the states will form the Interstate Council comprising of the Presidents and Prime Ministers; Council of Prime Ministers; Council of Ministers of Foreign Affairs; and Council of Defence Ministers.

The activities of the Interstate Council and its institutes is executed on the basis of mutual recognition and respect of state sovereignty, principles of equal rights and non-interference in internal affairs, peaceful settlement of disputes, respect for human rights and freedom, diligent realisation of commitments undertaken, and norms of international law.

So far the Heads of State and Government have signed more than 40 documents on major directions of multilateral cooperation.

The documents accepted ensure legal, economic, and organizational conditions for free circulation of labour, deepening of direct economic ties between legal entities, strengthening of industrial cooperation, and realisation of agreed policies in the field of development of communications and transport, oil and gas conduits, settlement of tariffs for railway transport, solution of problems of regional water-power resources, and rational use of interstate economic water sources.

The Convention on Regulating Migration of the population and the Programme of Cooperation in the Field of

Migration allow state participants to work together in this important issue.

An agreement reached and signed in July 1998 in the area of prevention and liquidation of emergency situations was a very important step in setting up a framework for reciprocally coordinated assistance amongst the state participants in case of emergency situations resulting from natural disasters and technological accidents.

Further integration is impossible without its linkage to the issue of strengthening economic solidarity. There is an active search going on currently for identification of reciprocal sectoral interests.

For financing programmes and industrial projects of common regional importance, the Interstate Central Asian Bank of Cooperation and Development, located in the city of Almaty, was established. The bank has branches in the cities of Bishkek and Tashkent.

The document, embracing the main spectrum of mutual cooperation for the short-term period, gives the programme of top priority operations which is approved annually by the Council of Prime Ministers of the participant states.

Following the conclusion of the bilateral conventions, conditions of free trade between the states participating in the treaty were created. The common principles of indirect tax levies (value-added tax and excise tax) in mutual trade are being carried out. Measures to shape regional capital markets are being finalised. Arrangements for protection and encouragement of mutual investments and elimination of double taxation have been achieved. In addition, the Convention on Capital Markets, which has been accepted, lays down common principles.

All these will contribute to an increased flow of investments into the region. Other



regions' experiences prove that only active use of possibilities connected with attractive investment will provide a realistic base for successful market competition and integrate the countries of the region in the existing international system. Cooperation in investment issues then will play a stabilising role in development.

In 1999, the Central Asian Economic Community States reviewed the achievements five years after the date of signing the Treaty on the Establishment of Integrated Economic Space.

**ASIA-EUROPEAN CONTINENTAL BRIDGE:  
SUSTAINABLE DEVELOPMENT STRATEGY  
IN CHINA'S ZONE**  
**Dr. Fan Wanxuan and Zhao  
Yinghong**

*Hunan Academy of Social Science and  
Longhu Demonstration District of the  
Urban Eco-economy, China*

Based on the principle of eco-economy and the fact that the Asia-European Continental Bridge has opened up China to the outside world, the paper proposes that the access should be also used to implement China's sustainable development strategy and to establish a perfect system of coordinated economical, social, and ecological development. This is of key significance, especially for China's middle and western areas. The enthusiasm for expanding and opening up the provinces along the Continental Bridge is rising to unprecedented heights. Establishing and strengthening export bases, training the 'first' production, improving information networks, and raising the level of production should be undertaken.

In addition, to take full advantage of the Bridge, the investment environment has

to be made more conducive to draw international funding. Establishment and expansion of trade relations with CIS countries are also equally important. Therefore, it is important first to increase border trade to gain more benefits and to establish relations at various levels. Based on these, new forms of economic cooperation and transnational management should be explored. It is equally important to continue and expand good neighbourly relations with Pakistan and through them establish connections and trade associations with the Arab countries and other states in the Middle East.

**Conclusions**

The main conclusion from the presentations and discussions is that regional cooperation is absolutely necessary for sustainable development of the region. The Central Asian countries have already embarked on this road with many treaties and agreements. The main bottleneck appears to be the present economic crisis that forces each country to focus more on internal problems, and which in some instances may not be resolved without strong regional cooperation.

The emerging consensus, as reflected in the Urumqi Declaration, supports a greater role for CoDoCA in facilitating this regional exchange, interaction, and ultimately cooperative action throughout many different areas of the economy, environment, and society.

Regional cooperation in certain projects, such as opening the Silk Road, has encouraging prospects. There is also the proposal to promote Central Asia as the Asia-Europe Continental Bridge - an idea that is meaningless without strong regional cooperation.

## Conclusions

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### **An Overview of Problems**

#### **Protection of Living Standards**

The Central Asian countries have achieved relatively reasonable standards of living comparable with many middle income and upper ranks in developing countries. The recent economic crises with major disruptions in economic activities are adversely affecting living standards. Unemployment is increasing and many households are experiencing difficulties in meeting basic needs.

The situation in Central Asian countries is quite different from most developing countries trying to overcome the firm grip of poverty. Rather than moving up from very low income levels, their problem is protecting what they have achieved and preventing a further slide in income levels and other standards. The countries of Central Asia have in the past had relatively favourable indi-

cators of human resources — including the gender dimensions of these indicators—something in which most developing countries are pretty far behind.

#### **Protection and Sustainable Use of Natural Resources**

In spite of the fragile environment, the region is richly endowed with many valuable resources that are in demand outside the region. There are also certain natural resources, such as water, which are commonly shared by the different countries of the region. In the past, during the period of control by the former Soviet Union, use of natural resources was guided by only one consideration; that of exploitation. Economic and environmental factors did not play much of a role in decision-making, resulting in many uneconomic activities that dangerously damaged the environment in many areas. The challenge for the coun-

tries of the region is to improve the conditions of degraded natural resources and to use these on a sustainable basis for the benefit of the people. Many communities closely associated with the use of certain resources in the past, such as the nomads, want a greater say than before in how these resources are to be used in the future.

### **Pollution Control**

This is probably the most serious challenge for the region. Soil, water, air, and other resources show very high levels of pollution — almost equal to those seen in the developed countries. There is also extensive degradation of forests and rangelands. Fortunately, there is a growing concern in the region about the levels of pollution, and different measures are being applied to deal with it — including control of many polluting activities, both agricultural and non-agricultural. A unique form of pollution was also reported from the region in the form of rocket-debris and efforts to regulate this are also taking place.

### **Economic Crises**

Many of the countries of Central Asia have experienced serious economic crises, following the dissolution of the former Soviet Union and the recent economic crisis in Russia. The countries are in a period of transition from a centrally planned economy to a market-oriented economy, and this has led to the closure of many activities that lacked the means to sustain themselves. Shortage of goods and lack of resources to import needed goods and services, as well as to maintain the previous economic structure with its huge subsidy and administrative apparatus, have resulted in increasing hardship for many. It is said that the poorer groups of people are suffering the most and previously unknown forms of inequality are beginning to appear in these societies.

### **Lack of Decentralized Decision-Making**

Among the main difficulties encountered in the transition to a market economy are the lack of experience and the absence of appropriate institutional mechanisms to facilitate decentralized decision-making. These problems are being seen in industry, in the market, in local government, in different departments, and even in communities. The entire system was geared to receiving orders from the top and acting on these, irrespective of their appropriateness for the unit in question. Taking responsibility and being accountable for one's decisions and actions take time to develop as experiences in the region are demonstrating.

### **Ownership, Tenancy and Access Rights**

Another important problem in the transition to a market economy and the management of natural resources has been the absence of well-defined systems of ownership and tenancy rights, and consequently ill-defined access rights. With a history of only state control over all natural resources and lack of private ownership of land, difficulties are being encountered in creating a system of private ownership that is both responsible and accountable. The issue of ownership is also related to the question of prices and taxation. While concerted efforts are being made, the change is slow and not without many difficulties.

Private ownership and management cannot function effectively without a well-defined legislative framework through which various types of contracts can be enforced. Laws without enforcement are a serious problem, hampering the transition to a market economy.

### **Priority Issues**

While all the above-mentioned problems are very important, the common link be-

tween all of the above problems is the issue of alternative institutional development to facilitate the transition to a market economy. Institutional development can promote private decision-making that is responsible and accountable; encourage the growth of entrepreneurs, risk taking and new investment; permit participation by multiple stakeholders; and effectively cover the vacuum created by the retreat of a heavy government. The change from centralized decision-making to a participatory decentralized system of management has to take place in an evolutionary context - 'learning by doing' on many fronts and being flexible enough to correct mistakes as they appear. While there are many areas in which the region can learn from the rest of the world, some of the most difficult problems are overcome only by hard experience.

### **The Role of the Government**

The governments in the region have the most difficult task of not only retreating from certain activities but facilitating the development of new institutional arrangements, enforcing the new rules of the game, and creating the environment for the growth of new opportunities. Much of the cleaning-up operations will be the responsibility of the government. If there is clearly a retreat in many economic sectors, the same may not be true in the social and environmental sectors, although even here the traditional roles may need to change so that government activities create conditions for other actors to enter if they so desire.

Apart from the management activities, the government should play an active role in terms of promoting regional and international cooperation.

### **The Role of the NGOs**

The NGO concept is a new one in the region and, while there are many good examples, there is still a long way to go.

NGOs have an entrepreneurial role, a catalytic role, an advocacy role, and an awareness-raising role. The entrepreneurial role is seen from the many rural development initiatives that have been undertaken. This role needs to be substantially strengthened in the context of a withdrawing government and other infant private sectors. The catalytic role is evident in the affairs of the local community where experience in taking responsibility for local development in social, economic, and environmental areas still needs to be generated. The advocacy role is seen in terms of promoting the interests of the local people and the community. At a time when economic priorities dominate, there is a big danger of side-stepping local issues. Similarly, when there are choices between economic and environmental sectors, it may be only on account of NGO advocacy that environmental factors get priority. Clearly there are many areas in which advocacy is necessary, and this role is best played by NGOs. Insofar as awareness-raising is concerned, this role is both local and national. The transition from a centrally-planned to a market economy has left many grey areas about which the government and all the actors need to know more. The role of NGOs in the future development of the Central Asian countries is indeed very crucial, and the policy of the government towards NGOs may well determine the extent to which NGOs can discharge their responsibilities effectively.

### **Role of the Private Sector**

The increasing role of the private sector in all aspects of the economy and the environment is crucial for successful transition to a market economy. The private sector needs to play a pivotal role in boosting new investments and mobilising the resources needed to promote economic activities, both old and new. All the main sectors are in need of huge investments. Infrastructure is in need of repair and maintenance. For-

tunately, the region is endowed with a highly educated labour force that is relatively cheap. While the role of the private sector is all encompassing, in order for it to play an active role, the government needs to create an appropriate environment with laws and mechanisms for enforcement of these laws. Peace is essential for investments to grow and governments have a key role in providing for the maintenance of law and order.

Ultimately it is a matter of partnership between the private sector, the government, and the community move together towards the path of sustainable development in the region.

### **The Role of Regional Cooperation**

Regional Cooperation in the region is a matter of economic and environmental necessity and, therefore, politically desirable. Sharing common resources and a similar type of environment, the region needs to work together to make the most efficient use of common resources such as water. Apart from harnessing some natural resources on a sustainable basis, there are many unique natural resources that need to be protected and preserved, and this is not feasible without strong regional cooperation. There are also important economic opportunities that could be better promoted under a regional framework than by individual countries.

There are already very encouraging experiences in cooperation on an interstate basis and in the future this should be emphasised and promoted in both economic and environmental endeavours.

### **The Role of International Cooperation**

International Cooperation is essential to provide adequate levels of support to the region so that it can make a successful transition to a market economy. The region is experiencing serious economic difficulties and, in spite of fairly promising potentials, it is facing crises in terms of resources. The international community has a key role to play in this respect.

The other area in which the international community can play an important role is in providing technical assistance to the region — particularly in economic matters regarding market operations and in many others such as law, arbitration procedures, and also in sociocultural aspects that have been generally neglected in the past.

The **Urumqi Declaration** and the **Altai Declaration** are the most important outputs of this Conference and these reflect all of the concerns stated above. In fact, in some areas, they go far beyond calling for specific action in different fields.

## Declarations

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**(Light editing has been carried out for the purpose of publication in this report.)**

# URUMQI DECLARATION

### **Preamble**

The Council for Sustainable Development for Central Asia (CoDoCA) conducted its second conference in Urumqi, Xinjiang, China, from September 13-18, 1998. The conference was hosted by the Chinese Academy of Sciences and the Xinjiang Institute of Ecology and Geography and was attended by 170 participants from 24 countries, including 11 from Central Asia.

The Central Asian region is defined as the area covered by Kazakhstan, Kyrgyzstan, Tadzhikistan, Turkmenistan, Uzbekistan, Mongolia, Western China, the East-Central part of the Russian Federation (Altai, Buryat, Khakas, and the Tuva Republics), the Himalayan states of Bhutan and Nepal, Northern India, North Pakistan, and Afghanistan.

### **Declaration**

Participants at the conference, after reviewing over 100 papers and considering the opinions presented by scientists, scholars, and experts and following discussion

Declarations

and exchange of views on issues such as environmental protection, sustainable development and the limited carrying capacity of Central Asia's arid plains and mountains, unanimously make the following declaration, hereby called the '**Urumqi Declaration for Central Asia**'.

**The Conference recognised the factors outlined below.**

- ▶ Central Asia is a distinct region of the world united by its special characteristics and is of high ecological, economic, and cultural significance, not only for the people of the region, but also for the people of the whole world.
- ▶ Central Asia is a global reservoir of: water, natural resources, biodiversity, and cultural heritage and include some of the last nomadic cultures that have sustained human civilisation without impinging on the carrying capacity of the land for thousands of years.
- ▶ The mountains of Central Asia are the most important source of water for the region.
- ▶ Central Asia is the home of the world's longest and highest chains of mountains, and for centuries these have provided spiritual and physical nourishment to humanity.
- ▶ Central Asia has vast indigenous human resources with a mostly untapped potential of knowledge of and experience with the sustainable use of natural resources.
- ▶ Central Asia has undergone changes, some of which have adversely affected the economies, environments, and livelihoods of the people; and these include loss of soil fertility and decrease in availability of water and have caused pollution and loss of biodiversity.
- ▶ Vast opportunities are available in Central Asia:
  - to develop the area in a sustainable way,
  - to mitigate the ill effects of the actions of the past,
  - to use in a sensible way the reservoir of knowledge and experience and physical resources available in the region for humanity, and
  - to develop economic and business activities in all fields including (eco) tourism.
- ▶ The Central Asian governments, communities, and peoples have generally increased their awareness of environment and development, and they have taken many practical steps and made substantial progress since the 1992 UN Conference on Environment and Development (which resulted in declarations such as the Rio de Janeiro Declaration on Environment and Development, (Agenda 21) and others such as the declaration of the first CoDoCA Conference in Ulaan Baatar 1994).
- ▶ Many nations in the region have put forward their Agenda 21 and programme priorities that are being implemented.
- ▶ According to the UN Charter and principles of international law, and under the prerequisites of respecting the sovereign rights of every country, nations are to use their natural resources based upon their international obligations, national laws, and policies on environment and development.

**The Conference acknowledges the following points.**

The positive role CoDoCA has played during the past years along with the Ulaan Baatar Declaration, following the first Conference on Sustainable Development of Central Asia, and organization of the second conference in Urumqi.

The participants are of the opinion that Central Asian nations face common issues, therefore closer cooperation on regional and transboundary issues is vital to achieve sustainable development.

Mistaken actions during the accelerated social and economic development in the past have hastened the environmental degradation of Central Asia causing (i) natural disasters (such as deforestation resulting in erosion, flash floods, and landslides; reduced water resources; desertification by overexploitation of the scarce natural resources in, for example, the oases; over-irrigation leading to salinisation; overgrazing leading to degradation of natural pastures; loss of biodiversity causing extinction of rare species; and overexploitation of scarce water resources causing the drying of rivers and lakes and causing deterioration of water quality), (ii) industrial and agricultural pollution, and (iii) a negative impact on human health.

Sustainable development can only be attained with environmental security and through conservation and sustainable use of natural resources.

Sustainable development can be attained by using transparent and good governance and participatory and community-based development practices that respect the specific characteristics and requirements of the local communities. In order to bring about harmonious development of the environment and economies of Central Asia with the participation of all stakeholders, public awareness of the needs and benefits of sustainable development should be strengthened through, e.g., publicity through the media, extension, education, training networks, and exchange of information.

Sustainable development requires technically and socially acceptable, economically viable, and scientifically-based management of land, water, and other natural resources; prevention of desertification and land degradation; eco-tourism development; conservation and sustainable use of biodiversity; promotion of renewable sources and efficient use of energy; gender equality; protection of cultural resources; and human resource development.

Sustainable development requires sustainable funding — including access to micro-credit and long-term funding and the commitment of governments, donors, financial institutions, and the private sector.

Sustainable development requires that governments substantially increase budgets for environmental protection and provide the necessary funding for scientific and academic institutions, ecological education, and monitoring of the environment as well as legal enforcement.

Sustainable development requires cooperation between the nations who share the same resources and face issues of common concern.

Sustainable development requires that before any project is undertaken environmental and social impact assessments are carried out.

The government and non-government organizations in Central Asia should make and promote increased use of opportunities offered by international conventions and other multilateral agreements.



Sustainable development requires that developments in trade, industry, transport, agriculture, and tourism are facilitated in an environmentally friendly way.

The conference recommends that Central Asian governments take up the issue of sustainable development with increased political will and commitment.

The planning for sustainable development centres around people and local communities.

The donors and funding agencies who have played a positive role in sustainable development so far should continue their commitments.

CoDoCA should continue and expand its functions as a facilitator and a platform to ensure the continuation of dialogue on the above-mentioned issues and to improve facilities for exchange of information to create and maintain a network of governments, non-government organizations, the private sector, the donor community, scientific institutions, and individuals interested in the region and to form linkages with existing networks within and outside the region.

CoDoCA will identify and develop a programme of regional initiatives on sustainable development and take the necessary steps to implement these — including the organization of workshops, meetings, etc.

CoDoCA will establish a programme secretariat for developing and facilitating a Central Asian network for exchange of knowledge and experience.

CoDoCA will establish informal regional working groups on various subjects to initiate and augment cooperation between the countries.

Urumqi, 18 September, 1998

# The Altai Declaration

## Protocol of Intentions

Considering the importance of implementing Chapter 13 of Agenda 21 (Rio de Janeiro 1992), and considering that we must resolve the problems of sustainable development of mountain regions together, this declaration is made.

On the initiative of the government of the Altai Republic, the representatives of government institutions of China, Kazakhstan, Mongolia, and the Russian Federation (hereinafter the four countries) participating in the Second CoDoCA Conference on Strategic Considerations on the Development of Central Asia (Urumqi, China) discussed the need to adopt an intergovernmental Altai Mountain Areas Convention on Sustainable Development ('Altai Convention').

**Whereas** the Altai Mountain areas exhibit outstanding ecological, cultural, and resource values that include a wealth of water and recreational resources and rich biodiversity, the four countries sharing the Altai Mountain areas have a common responsibility to protect and develop these values in trust for the world community.

They have already acknowledged this responsibility through the establishment of protected areas in the Altai Mountain areas of each of the four countries and by nominating some of these in the Altai Republic as UNESCO World Heritage Sites.

The Altai Mountain areas within the four countries have a need to improve economic development, generation of income, and the development of infrastructure.

The absence of a policy for sustainable development of the Altai Mountain areas is resulting in unsustainable use of natural resources, degradation of the environment, and social problems.

A number of large development projects that have been proposed may bring harm to the region.

The undersigned have therefore concluded that there must be a coordinated regional policy for protection and sustainable development of the Altai Mountain areas.

The undersigned believe that an appropriate mechanism for this purpose will be the conclusion of an Altai Mountain Areas Convention on Sustainable Development (Altai Convention), and they recommend that their respective governments enter into negotiations for the conclusion of such a convention without delay.

The goal of this Convention should be to work out and implement a coordinated policy for development of the entire Altai Mountain Area, resulting in the establishment of a transboundary Biosphere Reserve according to the standards of the Seville Strategy for UNESCO Biosphere Reserves.

The Convention must include the key components of protection and development, including protocols on the initiatives given below.

- ▶ Establishment of transboundary protected areas and biodiversity programmes, including, among others, a conservation strategy for the Snow Leopard and the Argali Mountain Sheep
- ▶ Development of ecologically and culturally appropriate and economically competitive land-use systems, including, among others, grazing, agriculture, forestry, and water management
- ▶ Practical support for such land-use systems, including traditional knowledge and practices; provision of environmental safety strategies
- ▶ Development of an environmentally friendly energy supply, transportation, and communications' infrastructure
- ▶ Sustainable eco-tourism development based on local community involvement, including transboundary tourism
- ▶ Provision of transboundary exchange opportunities between mountain communities
- ▶ Cooperation in the fields of culture, science, and education
- ▶ Protection of sites of cultural, historical, and religious significance

The undersigned acknowledge that on the issue of protected areas, at this time steps must be taken to prepare for the signing of an inter-governmental protocol on protected areas as one component of the Altai Convention.

For this purpose, the undersigned propose to create a working group which, within one year of the signing of the Altai Convention, will jointly prepare a protocol on protected areas for signing by the governments of the country signatories to the Altai Convention.

In order to develop the Protected Areas' Protocol and other protocols (on tourism, transport, land use, etc) under the Convention, the undersigned recommend undertaking a joint consultation process.

The undersigned encourage the involvement of governments with experience in preparing similar conventions such as the signatories to the Alps' Convention (Austria, Germany, France, Italy, Switzerland, etc).

The undersigned request that, owing to his experience in international cooperation in the Altai, Mr. Vasili K. Manyshev, Chair of the State Committee on Environmental Protection of the Altai Republic (Russian Federation) take on the role of coordinator of this process.

September 18, 1998



# Detailed Programme

**Monday, September 14, 1998**

## **MORNING SESSION:**

Official Registration

## **OPENING CEREMONY OF THE SECOND CoDoCA CONFERENCE**

Venue: Main Conference Hall, Hotel World Plaza Urumqi

### **Welcome to the Conference by the Organizers**

- Mr. S. Tideman, Chairman of CoDoCA
- Prof. Song Yu Dong, Xinjiang Institute of Ecology and Geography, China.

### **Opening Statements by the Government Leaders of Central Asia**

- Prof. Wang Huai Yu, Vice Chairman, Xinjiang People's Government
- Madam Liu Xiuru, Director General, State Environmental Protection Agency, China
- Mr. Kyshtybaev, First Vice Minister of Environment, Kyrgyzstan
- Mr. Bulat Esekin, Director, National Environment Centre, Kazakhstan
- Mr. Bedhyurov, National Representative, Altai Republic, Russia
- Mr. Togtokh, Member of Parliament, Mongolia

### **Opening Statements by the Co-organizers**

- Madam Fu Shuqin, Chinese Academy of Sciences, China
- Dr. M. Banskota, Deputy Director, ICIMOD

### **Opening Statements by the Donors**

- Mr. Bosnjakovics, Netherlands' Government
- Dr. Stephan Husy, Swiss Government

### **General Report**

Outline of the papers presented (Mr. F.W. Croon, CoDoCA)

### **Closure**

- Group photo to be taken outside the hotel
- Lunch (informal, hosted by CoDoCA)
- Venue: Chinese restaurant, ground floor

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Detailed Programme

## Monday, September 14, Afternoon Sessions

### Session 1: Water: A Vital Resource

Chairman: Mr. Allard Stikker  
Co-Chairman: Prof. A. Pulatov  
Reporter: Mr. F.W. Croon  
Venue: Main Conference Hall

Name	Country	Title
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#### Opening by the chairman

Prof. K. Warikoo	India	Need for Rational Use of Water Resources
Dr. Alim Pulatov	Uzbekistan	Development of Environmentally Sustainable Agricultural Systems in Uzbekistan
Prof. Zhang Xin Shi	China	The Desert Oasis Ecological Agricultural Pattern of Xinjiang
Dr. M.M. Sainju	Nepal	Use and Development of Eastern Himalayan Water Resources: Problems and Prospects
Fan Zili and Ji Fang	China	Sustainable Development of the Main Stream of the Tarim River
Prof. Liu Chen Ming	China	Water Problems in Semi Arid and Arid Regions of Northwest China
Dr. Erkin Orolbayen	Kyrgyz Republic	The Problem of Water Distribution in Central Asia

Discussions / Conclusions  
*Coffee Break*

### Session 2: Land Management

Chairman: Prof. Don Dedunah  
Reporters: Mr. C. de Haan and Dr. Carol Kerven  
Venue: Main conference hall

Prof. I.V. Severskiy	Kazakhstan	The Role of Mountain Territories in Sustainable Development of Central Asia
Prof. Liu Dong Sheng	China	Basic Strategy for Sustainable Development: China
Mr. Cees de Haan	USA	Sustaining the Rangeland of Central Asia – A Global Perspective
Prof. Chen Guangwei	China	Stakeholders in Sustainable Land Management
Dr. Dzholdoshev K.D.	Kyrgyzstan	Land Use Improvement of Natural and Pastures in Kyrgyzstan
Prof. Ci Longjun	China	Desertification and Rehabilitative Strategies in China
Dr. T.N. Dhar	India	Land and Water Resources in the Indian Himalayas: Issues of Development, Uses, Sustainability and Peoples' Dimension

Discussions / Conclusions

Welcome Banquet. Hosted by the Vice Chairman of the Xinjiang Uyghur Autonomous Region.

Venue: Chinese restaurant, ground floor, main dining hall

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## Tuesday September 15, 1998

### Session 3 : Protection of Nature and Biodiversity

Chairman : Dr. Stephan Dompke  
Co-Chairman : Dr. Z. Batjargal  
Reporter : Lisa Tracy  
Venue : Main Conference Hall (gr.fl.)

Speaker	Country	Title
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#### Opening by Session Chairman, Dr. Stephan Domke (Ger.)

Prof. Hirono	Japan	Environmental Challenges for Central Asia
Dr. Z. Batjargal	Mongolia	The Problem of Land Tenure in Mongolia
Prof. Yan-ling Song	China	Conservation of Wildlife Resources
Dr. Stephan Dompke	Germany	Biosphere Reserves in Central Asia
John Hare and Dr. Yuan G. Ying	UK, China	The Lop Nur Nature Sanctuary

#### Coffee Break

Dr. G.M. Malikyar	Afghanistan	Community-based Natural Resource Management in Afghanistan
Dr. M. Shishin	Russia	NGOs as a Force in the Spiritual Ecological Transformation in the Altai
Dr. V.K. Manishev	Russia	Land Resources in the Altai Republic
Dr. Arshad Ali, Abdul W. Jasra, and M. Umar Farooq	Pakistan	Seabuckthorn-A Promising Plant to Improve the Carrying Capacity of Grazing Resources and Facilitate Socioeconomic Upliftment of Farming Communities in the Northern Areas of Pakistan
John Hare	UK	Protection of Wild Camels in Central Asia

#### Discussion / Conclusions

### Session 4: Sustainable Grazing

Chairman : Prof. Don Bedunah (USA)  
Co-Chairman : Mr. Cees de Haan  
Reporter : Dr. Carol Kerven (UK)  
Venue : Side of the Main Conference Hall

#### Opening Statement by the Chairman

Prof. D.J. Bedunah and Daniel Miller	USA	Importance of the Maintenance of Traditional Livestock Herding Culture in Sustaining Rangeland
Dr. Carol Kerven and Ilya I. Alimaev	UK	Mobility and the Market: Economic and Environmental Impact of Privatisation on Kazakhstan
Prof. Lang Bei-ning, Ma Yu-shou, John Davis, Shi De-jun, Wang Qi-Ji	China	'Black Soil Type' Deteriorated Grassland

#### Coffee Break

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Detailed Programme



## Tuesday September 15, 1998 (contin.)

Ms. Camille Richards and Daniel Miller	USA	Grazing Commons of the Hindu Kush-Himalayas and Tibetan Plateau: Constraint or Opportunity
Dr. Peter Finke	Germany	Changing Property Rights' Systems in Western Mongolia
Mrs. Sarah Robinson	UK	Privatisation and Changes in Pasture Use in Betpak-Dala Central Kazakhstan
Dr. Karibaeva, L. Shavanova, and Dr. V. Lysenko	Kazakhstan	Environmental Indicators of Sustainable Development in the Regions of Kazakhstan.
Discussions / Conclusions		

### Session 5: Economic Policy and Planning (parallel Session)

Chairman : Dr. Fu Lai Sheng

Reporter : Prof. P. Treuner

Venue : Main Conference Hall (1st. floor)

#### Opening by the Chairman

Prof. R.Pomfret	Australia	Transition to a Market Economy, Poverty, and Sustainable Development in Central Asia
Prof. Ren Yong, Xia Guang, and Gao Tong	China	Mechanism for Coordinated Development of the Environment and Economy in the Less Developed Regions of China
Prof. U. Sultangazin	Kazakhstan	Kazakhstan's Programme for Sustainable Development: Issue of Support for Science and Information
Dr. A. Jones	UK	Balancing the State and the Market for Sustainable Development: A Policy Economist's Perspective on the Changing Role of Government in the Former Soviet Republics of Central Asia

#### Coffee Break

Mr. T. Enebish	Mongolia	Environmental Policy of Mongolia
Prof. P. Treuner	Germany	Primary Integration of Socioeconomic and Ecological Objectives in Critical Land Use Decisions
Mr. King-Yu Kwok	Hong Kong	The Risk Precaution Approach to Sustainable Development
Mr. Peter M.K. Wong	Hong Kong	Economic and Cultural Development
Mr. Leo Stephan	Netherlands	She gave a presentation
Dr. Hazel Henderson	USA	Video Presentation

Discussions / Conclusions

Dinner in Muslim style, hosted by CoDoCA; Muslim restaurant

Video presentations: Xinjiang, Ladakh, Kyrgyzstan

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## Wednesday September 16, 1998

Excursion/Field Trip

Video Presentations: Xinjiang, Ladakh, Kyrgyzstan

## Thursday September 17, 1998

### Session 6: Participatory Approaches; The Role of Education, Culture and NGOs (Plenary Session)

Chairman : Dr. Shirin Akiner

Reporter: Dr. Tim Grout-Smith

Venue: Main Conference Hall

Name	Country	Title
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#### Opening by Session Chairman

Tim Grout-Smith and P. Worms	UK	Public Interest in Developmental and Environmental Initiatives
Samantha Reynolds	UK	The Community Forum an Example of Sustainable Civic Innovation in Afghanistan
Dr. Yuri Badenkov	Russia	Karateghin-Altai as the Transportation Corridor: A Key to Integration of Remote Mountain Areas into the Central Asia Environment?
Dr. Makeyev	Kyrgyzstan	National Capacity Building in Kyrgyzstan
Mels Eleusizov	Kazakhstan	Role of NGOs in Improvement of the Ecological Situation; Tabigat, An Example

#### Coffee Break

Prof. Wang Yi-Ming	China	Effect of Population Resettlement on Sustainable Land Use
Betty Davis	Germany	Environmental Law in Russia and Kyrgyzstan
Mr. G. Mortensen	USA	Community Development in Northern Pakistan
Discussion / Conclusions		

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Detailed Programme

## Thursday September 17, 1998 (Cont....)

### Session 6: Financing of Development and Micro-credit (Parallel Session)

Chairman: Mr. Sander G. Tideman  
Co-Chairman: Dr. Sun Ruo Mei  
Reporter: Dr. Hemanta R. Mishra  
Venue: Main Conference Hall

Speaker	Country	Title
Opening by the Chairman		
Sue Carey	Canada	Micro-Finance in China: A Xinjiang Case Study
Dr. Sun Ruo Mei	China	Micro-Credit for the Poor of China
Dr. Joseph A. Weinstock	USA	The ADB's Commitment to Sustainable Development in Central Asia
Chen Naxin	China	HPI's Model for Helping the Poor in China
Dr. Hemanta R. Mishra	Nepal	Promoting Sustainable Development: The role of the Global Environment Facility
Discussion / Conclusions		
<i>Coffee Break</i>		

### Session 7: Culture and Ecotourism (Reviving the Silk Road) (Parallel Session)

Chairman: Max Haberstroh  
Reporter: Dr. Shirin Akiner  
Venue: Main Conference Hall

#### Opening by the Chairman

Prof. Pei Shengji	China	Indigenous Knowledge and Cultural Resources for Mountain Development and Conservation
Nancy Nash	Hong Kong	Buddhist and Islamic Values for Nature Protection
Max Haberstroh	Germany	Knocking on Heaven's Door: Revival of the Silk Road Philosophy
Dr. P. Sharma	Nepal	Experiences in Promoting Mountain Tourism for Local Development: Lessons from Nepal
Mr. Sonam Dawa	India	Ladakh after 25 Years of Tourism
Discussion / Conclusions		

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## Thursday September 17, 1998 (Cont....)

### Session 8: Energy and Other Examples of Sustainable Development

Chairman: Dr. M. Banskota  
Co Chairman: Dr. Raganathan  
Reporter: Ms. Archana Karki  
Venue: Side Hall (ground floor)

Name	Country	Title
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#### Opening by the Chairman

Dr. A. Zyrianov	Kyrgyzstan	Regional Cooperation in the Use of Water and Fuel and Energy Resources
Mr. Lu Feng	China	Wind Energy in Xinjiang
Mr. G.S. Ranganathan	India	Managing Water for a Sustainable Environment
Li Shou	China	Solar Energy in Xinjiang Province

#### *Coffee Break*

Mr. Wang Yong Xing	China	Sustainable Agricultural Development and Environmental Protection in Xinjiang
Dr. L. Shabanova, Dr. K. Karibeava, and V. Lysenko	Kazakhstan	Principles of Sustainable Use of Biodiversity

Discussions / Conclusions  
(Participants are invited to join the session in the main hall after their session)  
Banquet offered by Arcadis-Euroconsult. (Chinese style buffet in multi-function hall)

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Detailed Programme

**Friday September 18, 1998**

**Session 9: Regional Cooperation for Sustainable Development**  
(Plenary Session)

Chairman : Branko Bosnakovic  
Co-Chairman : Dr. Yuri Badenkov  
Reporter : Ms. A. Karki  
Venue : Main Hall (1st Floor)

<b>Speaker</b>	<b>Country</b>	<b>Title</b>
Branko Bosnjakovic	The Netherlands	Sustainable Development at the Regional Level: UN Economic Commission for Europe Policy and Legal Instruments
Mr. Nyamtseren	Mongolia	Mongolia as a Bridge for Central Asia

*Coffee Break*

Dr. Yuri Badenkov, V. Sabin, V. Reviakin, and Dr. V. Manishev	Russia	The Altai Convention: The Tool for Sustainable Development of the Mountain Areas in Russia, China, Kazakhstan, and Mongolia
Dr. N. Aitmurzaev	Kyrgyzstan	Propsectives of Economic Cooperation between States of the Central-Asian Economic Community (CAEC)
Dr. Fan Wanxuan and Zhao Yinghong	China	Asia-European Continental Bridge: Sustainable Development Strategy in China's Zone
Discussion / Conclusion		

**Concluding Session**

Presentation and Discussion of the Altai Declaration  
Signing of the Urumqi Declaration  
Farewell lunch (Chinese Restaurant)

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# List of Participants

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