International Conference

Experiences with and Prospects for Regional Exchange and Cooperation in Mountain Areas

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Preface

InWEnt, Capacity Building International Germany, acting on behalf of the German Federal Ministry for Economic Cooperation and Development, has formulated a four-year programme on management and leadership training for mountain development focusing on four countries: Nepal, Pakistan, Tajikistan and PR of China. In the framework of providing support to ongoing reform processes in the Himalaya-Hindukush-Pamir InWEnt and ICIMOD are jointly organizing the international conference on “Experiences with and prospects for regional exchange and cooperation in mountain areas” in Kathmandu which is supported by the National Planning Commission of Nepal. Strategic programme Partners are AKDN – Aga Khan Development Network, CIPRA – International Association for the Protection of the Alps, ZELF – Centre for Development Studies at the Freie Universitaet Berlin.

The six-year programme consists of International Leadership Training (ILT), regional training programmes and conferences. In addition the international conference on regional exchange and cooperation in the Himalaya-Hindukush-Pamir was organized to further enhance the aim of bridging the gaps between academia, decision-making and development practice. In this respect the international conference supports a process which has started with a series of conferences highlighting different aspects of mountain development. The Kathmandu Conference 2007 addressed the vital issues of neighbourly and regional cooperation for sustainable development in a changing socio-political and economic environment. Commencing with a state-of-the-art assessment the participants shared best practices in regional exchange and cooperation in mountain areas in order to identify future options and possible strategies. Thus, a holistic approach for mountain development was followed and complemented the activities for capacity building within the region and through international leadership training.

The proceedings volume presents the contributions and valuable inputs of the speakers during the conference and aims to make available the results from working groups and discussions to a wider audience of colleagues and people interested in mountain development, change management and their implications for the respective societies. With this volume we present a tool based on experiences by different actors and provide a source book for furthering the debate about exchange and cooperation. The book contains the views of different stakeholders and actors in mountain development, thus offering insight from different perspectives.

Hermann Kreutzmann
Welcome Address from Hans Pfeifer InWEnt

Mountains matter and mountain development has become increasingly important in a global context. The report on “limits of growth” by the Club of Rome raised awareness for the threatened environments of the world. Presently the implementation of the Millennium Development Goals and the Intergovernmental Panel on Climate Change (IPCC) Report are raising awareness again. The United Nations Environmental Programme recently launched its Geo-4 Report, two decades after the Brundtland Report introduced sustainable development as a goal to our thinking.

What has changed in the meantime? While previously solutions were sought in a national context the perspective of today is a global one. Best practices and experiences from all over the world are perceived as instrumental for a betterment of living conditions and safeguarding sustainable development.

Thirty-three years ago the “Munich Mountain Environment Manifesto” (1974) addressed the still valid key issues of mountain related development. The “Deutsche Stiftung für internationale Entwicklung” (DSE) – the predecessor organization of InWEnt – was one of the sponsors and prime initiators of that conference. InWEnt has pursued its commitment in the field of mountain development.

To address the changed needs in the age of globalization we are conducting a six-year programme based on a holistic approach to mountain development. International Leadership Training programmes are augmented by regional training workshops and regional conferences. Human Capacity building is the prime focus. Agents of change are selected and supported from the public and private sector. The philosophy of this approach is the notion that mountain regions and their people are marginalized and side-lined. This marginalization might lead to deteriorating living conditions and the over-exploitation of natural resources. Counter-acting to marginalization and side-lining we have identified the need for regional cooperation and cross-border exchange. The sharing of knowledge and expertise is a prime focus of human capacity building in mountain regions. Consequently the experiences from best practices and state-of-the-art research need to be utilized in a global context.

Here the European Alps come into the picture. Applied research and the implementation of results were driven by the practical needs of a mountain region in
the heart of Europe. The mountains were perceived as a region where the living conditions deteriorated while the surrounding lowlands attracted out-migrating alpine people and offered better living conditions.

The European Alps were taken as a model region to understand system properties. Concepts, methods and models were transferred to that region. Until today botanists classify certain layers of montane vegetation as “alpine”, approaches to combined or mixed mountain agriculture are described as Alp- or Almwirtschaft in non-European settings as well. This model region is the best researched and best understood mountain region of the world. The systematic approach combined the understanding of different system properties such as available natural resources in the shape of water, forests and pastures, their linkages with land use patterns and settlement, the importance of mobility and tourism in connection with energy generation etc. Therefore it is not surprising that experiences and model packages from the Alps were transferred to other mountain regions all over the world.


“Mountains of the world. A global priority” as the first review of achievements prior to the UN declaration of the “International Year of the Mountains” 2002 and the “Global Mountain Summit” in Bishkek in the same year. 2002 became the culmination point for activities in the field of mountain research and development so far.

InWEnt accompanied these activities through a sequence of conferences in which experiences from other world regions were projected towards the Inner Asian mountain region and in which a unique concept was applied. The nexus of research, development practice and policy-making and implementing has often been gravely neglected. The international conferences organized by InWEnt have specifically addressed the issue to reduce this gap in communication and exchange.

In the millennium year DSE/InWEnt cooperated with ICIMOD in hosting a first conference in Kathmandu under the title “Growth, poverty alleviation and sustainable development in the mountain regions of South Asia”. The InWEnt approach of bringing together experts from different backgrounds and facilitat-
ing the communication among them in specific working groups distinguishes our conferences from academic symposia and other workshops significantly.

Inspired by the success of the Kathmandu conference Chengdu was chosen as the venue for a second conference on “Poverty alleviation in the mountain regions of China”. In cooperation with IFAD, ICIMOD and the “Institute of Mountain Hazards and Environments” (IHME) in Chengdu the specific lessons learnt from the Chinese experience with poverty alleviation, food security and participative approaches in rural development were the central issues. The working group results again have shown how important it is to acknowledge the sectoral expertise and disciplinary languages when coping strategies, institutional development and decision-making processes need to be understood. These elaborations are well in line with the Bishkek Mountain Platform which intends to “guide governments and everyone involved with mountain issues on future activities and actions in the 21st century. Its ultimate goal is to improve the livelihoods of mountain people, to protect mountain ecosystems and to use mountain resources wisely”.

The international community is now gathering forces in the international Mountain Research Initiative (MRI). Today the focus is not any longer on ecological aspects only but on capacity building for mountain development as well! It has been recognized by the international community as well as by national governments that changes will happen only if successful capacity building programmes take place. To bridge the gap between theoretical research and county level implementation is the special experience InWEnt gathered through more than 40 years of activities.

Two more international conferences were held since in Lhasa and Dushanbe. The attention was drawn to regional issues in a particular setting. The “International Conference on Sustainable Rural Development in Mountainous Regions with Focus on Agriculture in the Tibetan Autonomous Region” addressed the specific situations of the districts and counties in sustainable rural development in Lhasa 2004. The Dushanbe conference on “Strategies for development and food security in mountainous areas of Central Asia” held in 2005 tried to broaden the perspective. Cross-border communication, exchange relations and cooperation were investigated in the Central Asian mountain interface of Afghanistan, Kyrgyzstan, Pakistan and Tajikistan.

The experiences from these activities were evaluated and led to the notion that capacity building requires a more holistic approach.
Globalization accelerated the winds of change in all mountain regions. Change management is a requirement for leading actors and stakeholders. Leadership training is embedded in a set of activities ranging from regional training workshops within the mountain areas to international conferences such as the one we are holding here in Kathmandu. In order to avoid marginalization best practices have to be studied for benchmarking and need to be implemented by actors who are qualified and sensitized for the challenges of the future.

Combining all three points the European Alps reappear in the picture. The “Alpine Convention” which was established as an initial forum for cross-border cooperation in the European Alps took nearly half a century to mature. The achievement is that eight countries agreed on cooperation in the fields of sustainable resource management, eco-tourism and exchange of information. Trans-border cooperation is perceived as a holistic approach to conservation and protection of mountain environments. The maintenance of peaceful conditions is the prime frame condition for the improvement of living conditions for mountain populations.

This approach and related experiences brings us back to InWEnt’s mountain programme in general and the Kathmandu Conference in particular. InWEnt is facilitating the transfer of knowledge from lessons learnt in the framework of the Alpine Convention. This is achieved by providing International Leadership Training in the Alpine region where preselected agents of change get the opportunity to experience face-to-face best practices, methodological approaches and strategies for implementation in the field. Afterwards the trained persons are supported in their respective regions in Nepal, Pakistan, Tajikistan and PR of China during a post-ILT transfer project phase. The institutionalisation of change requires support on a broad foundation. The European experiences and Asian challenges are bound together in order to setup a consistent and straightforward programme. Here the training courses and conferences help to expand the knowledge base, to identify deficits and niches of opportunity and to share experiences among participants.

It is my sincere wish that this conference carries forward our aim for a holistic support of change management and contributes to a better understanding of “experiences with and prospects for regional exchange and cooperation in mountain areas”.


Abbreviations and Acronyms

ADB       Asian Development Bank
AKDN      Aga Khan Development Network
AKF       Aga Khan Foundation
BCCN      Biological conservation Corridor network
BCS       Bhutan Corridor Strategies
CBNRM     Community Based Natural Resource Management
CBD       Convention on Biodiversity
CBO       Community Based Organisation
CIPRA     International Commission of the Protection of the Alpine Region
CKNP      Central Karakoram National Park
COP       Conference of Parties
CSOs      Civil Society Organizations
FAO       Food & Agricultural Organization
FATA      Federally Administered Tribal Areas
FDH       Fouta Djallon Highlands
GBAO      Gorno Badakhshanskaja Avtonomnaja Oblast’ (Gorno Badakhshan Autonomous Region)
GBM       Ganges Brahmaputra Meghna
GEF       Global Environmental Facility
GIS       Global Information System
GLOCHAMORE Global Change in Mountain Region
GLOF      Glacier Lake-Out-Burst Flood
GMS       Greater Mekong Sub-Region
GNH       Gross National Happiness
GOI       Government of India
HKH       Hindu Kush-Himalaya
HKKH      Hindukush, Karakoram and Himalayas
ICIMOD    International Centre for Integrated Mountain Development
ICS       India’s corridor Strategies
ICG       International Crisis Group
ILA       International Law Association
INWENT    Capacity Building International, Germany
IOL       India Office Library
IOR       India Office records
IPCC      Intergovernmental panel on Climate Change
IWC  International Watercourses
IWL  International Water Law
IWRM  Integrated Water Resource Management
IWT  Indus Waters Treaty
IYM  International Year of Mountains
IUCN  International Union for Conservation of Nature
       (World Conservation Union)
JC  Joint Committee (of MRC)
JDNP  Jigme Dorji National Park
KL  Kangchenjunga Landscape
KCA  Kangchenjunga Conservation Area
KBR  Kangchenjunga Biosphere Reserve
KKH  Karakoram Highway
KNP  Khunjerab National Park
MACP  Mountain Area Conservation Project
MC  Ministerial Council
MRC  Mekong River Commission
MRB  Mekong River Basin
MSDSP  Mountain Societies Development Support Programme
NEPAA  National Environmental Protection Agency of Afghanistan
NGO  Non-governmental Organisation
NCCW  National Council for Conservation of Wildlife
NCS  Nepalese Corridor Strategies for Protected Areas
NAPA  National Adaptation Plans of Action
NEA  Nepal Electricity Authority
NMC  National Mekong Committees
NNUP  Non-navigational Uses and Protection
NEFA  Northeast Frontier Agency
NWFP  North West Frontier Province
OAU  Organization of African Unity
PA  Protected Areas
PATA  Provincially Administered Tribal Areas
PES  Payments for Environmental Services
PGC  Power Grid Corporation
PHP  Pamir High Mountain Integrated Project
PR  Peoples’ Republic
PTC  Power Trading Corporation
REC  Regional Economic Cooperation
REC  Regional Exchange and Collaboration
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>RSTs</td>
<td>Remote Sensing Tools</td>
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<tr>
<td>RWRDP</td>
<td>Regional Water Resource Development Plans</td>
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<tr>
<td>SADC</td>
<td>South Africa Development Co-operation</td>
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<tr>
<td>SCO</td>
<td>Shanghai Cooperation Organization</td>
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<tr>
<td>SLT</td>
<td>Snow Leopard Trust</td>
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<td>SMD</td>
<td>Sustainable Mountain Development</td>
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<td>SMEC</td>
<td>Snowy Mountain Energy Corporation</td>
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<td>SSS</td>
<td>Seven Sister States</td>
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<tr>
<td>TNP</td>
<td>Tajik National Park</td>
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<tr>
<td>TPA</td>
<td>Trans-border Protected Areas</td>
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<td>TBC</td>
<td>Trans-border Biodiversity Conservation</td>
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<td>TCL</td>
<td>Trans-border Conservation Landscapes</td>
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<tr>
<td>TSNR</td>
<td>Toorsa Strict Nature Reserve</td>
</tr>
<tr>
<td>ULFA</td>
<td>United Liberation Front of Asom (Assam)</td>
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<tr>
<td>UN</td>
<td>United Nations</td>
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<tr>
<td>UNCED</td>
<td>UN Conference on Environment and Development</td>
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<td>UNDP</td>
<td>United Nations Development Program</td>
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<tr>
<td>UNEP</td>
<td>United Nations Environmental Program</td>
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<tr>
<td>UNESCO</td>
<td>United Nations Education, Scientific and Cultural Organization</td>
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<tr>
<td>UNFCCC</td>
<td>UN Framework Convention on Climate Change</td>
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<tr>
<td>WCS</td>
<td>Wildlife Conservation Society</td>
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<tr>
<td>WWF</td>
<td>World Wide Fund for Nature</td>
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Cross-border trade and communication in the Pamir-Hindukush-Karakoram-Himalaya
1 Introduction

1.1 Introductory Remarks by Conference Chair

Hermann Kreutzmann

Mountain development can be perceived as a holistic approach to regional development. In that respect, mountains do not differ from other areas. In our specific setting of the Inner Asian mountain belt these regions share common properties. Mountain regions are mainly the peripheries when they are part of a large nation state. Some states are mountain states. We are holding our conference in Nepal which is regarded as much as Tajikistan as a country dominated by mountains. Pakistan and PR of China are large countries with a varied ecology and topography.

All have international boundaries with neighbours in common which are located in mountains. The mountain regions have been arenas of contest in colonial and post-colonial times. Mountain borders have been the focus of conflicts and disputes.

Consequently, mountain regions have experienced a double-fold status over time. On the one hand, they are socio-economically challenged by ecological settings and economic opportunities. Mountain regions are rarely the prime centres of agricultural production and manufacturing. Infrastructure development affords high investments in an area of low population density and rather limited representation in political affairs of nation states. Mountain people often perceive their position as one of neglect. Minority issues about “disappearing peoples” and the loss of pristine culture are common in mountain settings.

On the other hand, the importance of international boundaries, conflicts and disputes in mountain areas has drawn a specific attention to the remote fringes of nation states. During the Cold War some of the most hermetically cut-off regions of the world were located in the Inner Asian mountain belt. The borders between Afghanistan, the PR of China, Pakistan and the Soviet Union represented a prime conflict constellation of the Cold War. Nepal in itself is sandwiched between to mighty neighbours.
The end of the Cold War and the overall perception of the coming age of globalization fundamentally changed this world view. Borders appeared to be permeable lines of exclusion and became perforated by transit and travel. Exchange of goods across boundaries was envisaged as an opportunity for participating in the world market. Suddenly the perception of mountain areas significantly changed.

A second aspect was the growing awareness of the environmental properties of mountain areas. The water towers of humankind are nowadays a well-known feature. Biodiversity spread across borders is envisaged from a global perspective. Environmental pollution does not stop at borders. Remedies for the mitigation of natural hazards and efforts for the reduction of environmental threat call for close cooperation across borders.

The potential for mountain development requires a proper infrastructure. If we perceive infrastructure in its broadest sense it consists not only of roads, buildings and basic facilities. Infrastructure in its wider perspective is a network of extension services, knowledge production, proper planning, facilitation of change and human capacity building.

Here the stage is prepared for the activities which bring us together. Fundamental changes have occurred in recent years and require adequate and appropriate responses. If we regard this as a holistic challenge then all layers of society are involved. All agents of change need to be alerted.

InWEnt and ICIMOD have cooperated with other institutions in a number of activities which led to important contributions as we have already heard. The present programme attempts a multi-layered approach:

- Long-term leadership training focuses on potential agents of change in the private and public sector
- Regional workshops augment this training effort in the respective mountain regions
- Regional conferences address specific topics of cross-border exchange and communication in the fields of commerce, trade and tourism, in mobility and migration as well as in natural resource and national park management
- International conferences as we are having here in Kathmandu

The Kathmandu International Conference is a sequel to symposia which were held during the last seven years. Beginning here in Godavari in 2000 when mountain development in South Asia was in focus, the next conferences addressed the Chinese mountain areas and specifically regional challenges in the Tibetan Plateau. Cross-border issues were put forward in the Dushanbe conference when for the
first time representatives from Afghanistan, Kyrgyzstan, Pakistan and Tajikistan were invited to share their experiences and identify “Strategies for development and food security in mountainous areas of Central Asia”.

Today we attempt to go a step further. Regional exchange and cooperation in mountain areas is our theme. Again a pre-selected group of experts in their field have been invited to share their experiences. Decision-makers who are instrumental for the planning of programmes and packages are representing one section of a triad. Academics who are permanently challenged by big issues such as climate change and sustainability contribute their analysis and recommendations for strategies. The third party are the practitioners who are faced with the every-day work in the field and who have to adjust the philosophy of development to the realities on the ground.

All three groups get only few occasions to meet and spend sufficient time together. Here in Godavari is the forum where in the course of the next three days we hope to provide the arena for stimulating discussions. Knowledge and best practices need to be shared and modified. What sometimes works within well-established institutions where people speak a common language gets a totally different direction when it comes to cross-border cooperation with colleagues. The communication in a mountain context and the shared understanding of mutually important challenges is one of the prime objectives of the international conference.

We provide food for thought from internationally renowned and leading experts in their fields. Equally important is the discussion and debate in working groups. Without the ownership of all participants the effort might be restricted to a brief period. When we aim for long-lasting effects we need to reach a common understanding, mutual cooperation and recommendations for our future work. We need to identify the fields in which cooperation seems to be auspicious and fruitful. The sharing of best practices can be promising for implementation into planning and practices. This we shall work for during the task and the time which is granted to us here in Godavari. I would like to thank all participants who have come from far away and the organizers who have enabled such a productive environment for our deliberations. With more specific instructions we shall start our work tomorrow morning.
1.2 Objectives and Structure of the Conference

Mountains matter. Let me repeat the statement which has led to numerous international efforts for mountain development. Sometimes the activities are haphazard and little coordinated. Mountains matter because they are an integral part of wider societies.

The European Alps have been taken as a case in point to show the importance of mountains. They are much more than a barrier to communication and less developed livelihoods. Sometimes they are associated with notions of backwardness and helplessness. But at the same time people and philosophers are seeking answers in their search for human origin and pristine cultures in the mountains. They identified the remote locations with a treasure trove which needed to be lifted.

Immanuel Kant, the German philosopher, who might be known to you for his influential work on the categorical imperative, was among those seekers for truth and treasure.

More than 200 years ago Immanuel Kant stated in his lectures on geography: "An improved knowledge of Tibet in Asia would be of utmost importance. Thus, we would gain the key to all history. This is the highest area on earth, probably it was settled earlier than any other, and might be the origin of all cultures and sciences. The punditry of Indian scholars in particular, seems to originate from there. At the same time all our arts can be traced back to Indostan, e.g. crop cultivation, the numbers, the chess game, etc. People believe that Abraham lived at the borders of Indostan. Such an original centre of arts and sciences, I would like to say, deserves the efforts of increased scrutiny."

Source: my own translation based on Kant’s lectures documented by Rink 1802: 115

Kant realized the importance of expanding knowledge about remote territories and the European quest for global domination. Driven by enlightened ideas he saw the danger of power politics at the same time. Therefore he supported the expansion of the rule of international law without specific and exclusive rights for European conquerors (Osterhammel 1998: 61). The freedom of movement and liberties for travellers and explorers were a precondition for Kant’s perception of independent knowledge generation. In his straight-forward thought a radical approach would lead to the banning of colonialism.
At a time when the European Alps were intimidating and thus hampering research the mountains of High Asia as Carl Ritter identified them were challenging the seekers for knowledge all over the world.

Our knowledge is still limited and insufficient, but efforts have been made in recent years to reduce this gap. We all have come a long way of “experimenting with truth” (Mahatma Gandhi) in seeking knowledge. Academic institutions and universities, think tanks and international organizations, development activists and lobbyists – a huge body of books, journals and publications is available and accessible through modern means. Nevertheless, sometimes it becomes rather complicated to find the appropriate information. Producers of knowledge need to cooperate and to share their findings with practitioners and beneficiaries. ICIMOD and InWEnt have been instrumental in coordinating such efforts in a holistic approach which has led to the implementation of the mountain programme.

In a modern world information-gathering and knowledge-sharing is the precondition for planning processes and the implementation of development packages. Therefore, the approach followed here is to bring together academic researchers, planners and decision-makers, as well as development practitioners from governmental and non-governmental organizations. Local and regional experiences need to be perceived on national and global levels. The same applies vice versa. The need to interlink and to integrate is indispensable for mitigating problems of today and in the future. Actors and stakeholders must meet to address fields of common interest and mutual challenge in space and time.

Nowadays we are sometimes addressing mountains only as regions of problems, as ranges of development deficits, but we rarely identify them as mountains of challenge and response, of chances and opportunities. The treasure trove of former times has changed. Nowadays we recognize mountains as centres of biodiversity, as collecting grounds for abundant varieties of herbs and plants, as destination for recreation and tourism, as centres of heritage and inspiration.

Our conference addresses cross-border issues and regional cooperation. Our ambition and efforts for the next three days should be directed towards professional communication and exchange of information across borders. We should use these three days for learning about best practices and for seeking opportunities for cooperation. The regional interest and significance should be on our mind. Therefore we should remember the objectives of this conference as they were laid down earlier:
The specific objectives of this conference are to

(i) provide and discuss state-of-the-art information on lessons learnt in Regional Exchange and Cooperation (REC) within mountain areas
(ii) contribute to a shared understanding on the role of REC for sustainable development of mountain areas
(iii) elaborate areas and options for further participation of mountain areas in cross-border cooperation (CBC) and the strategic and institutional implications
(iv) formulate recommendations on capacity development to support realization of potentials for REC
2 General Perspectives on Cross-Border Issues

2.1 Geopolitical Perspectives on Cross-Border Exchange Relations

Hermann Kreutzmann

1

1 Introduction

Mountain regions can be perceived as corridors enabling exchange between societies. At the same time, mountain ranges have also been interpreted as barriers to exchange. Boundaries and roads are symbols, representing both forms of interaction. In pre-colonial times, boundaries were merely invisible; nevertheless, they were felt as spheres of influence. Traders experienced these borders when taxes were levied. Mountain farmers had to contribute dues, on the one hand; and their sons for conscription, on the other. Commerce and trade across the mountains followed certain patterns in space and time. The term “Pass-Staat” was applied to centres in the mountains that controlled access to the trading centres, which connected lowland urban areas across mountains and which provided skills and transport. Certain areas in the mountains developed to become rich from trade: the Kashmir Valley and the Kathmandu Valley are prominent precedents in case. From monsoon-tropical conditions in the foothills, caravans had to master an altitudinal profile, which often reached higher than 5000 m in the nival zone before reaching the Tibetan plateau and/or the oases of Central Asia. Some smaller principalities took a similar advantage from their location as traders, who could cross rivers easily in winters, had to wait for opening of the passes in early summer. Trans-montane trade was significantly affected and modified by topography and climate in an environment of the political rivalry, raids and waylaying. Pre-modern trade conditions were transformed not only by innovations in transport technology, road-construction and bridge-building. The incorpora-
general perspectives on cross-border issues

2.1 Geopolitical Perspectives on Cross-Border Exchange Relations

Hermann Kreutzmann

Introduction

Mountain regions can be perceived as corridors enabling exchange between societies. At the same time, mountain ranges have also been interpreted as barriers to exchange. Boundaries and roads are symbols, representing both forms of interaction. In pre-colonial times, boundaries were merely invisible; nevertheless, they were felt as spheres of influence. Traders experienced these borders when taxes were levied. Mountain farmers had to contribute dues, on the one hand; and their sons for conscription, on the other. Commerce and trade across the mountains followed certain patterns in space and time. The term “Pass-Staat” was applied to centres in the mountains that controlled access to the trading centres, which connected lowland urban areas across mountains and which provided skills and transport. Certain areas in the mountains developed to become rich from trade: the Kashmir Valley and the Kathmandu Valley are prominent precedents in case. From monsoon-tropical conditions in the foothills, caravans had to master an altitudinal profile, which often reached higher than 5000 m in the nival zone before reaching the Tibetan plateau and/or the oases of Central Asia. Some smaller principalities took a similar advantage from their location as traders, who could cross rivers easily in winters, had to wait for opening of the passes in early summer. Trans-montane trade was significantly affected and modified by topography and climate in an environment of the political rivalry, raids and waylaying. Pre-modern trade conditions were transformed not only by innovations in transport technology, road-construction and bridge-building. The incorporation of mountain regions into empires and nation states significantly affected exchange relations and modes of communication.

In fact, two developments seem to be counteracting when interaction across borders is concerned. On the one hand, international boundaries clearly demarcate spaces of nation-states and indicate that borders are meant to exclude others from interference. On the other hand, modern communication in the shape of railways and roads has improved at a fast pace since the mid-19th century and is crossing the Himalayan Arc, which was perceived by Kenneth Mason (1936) as a “barrier to modern communication”. But, even his contemporaries were dreaming of a time when the physical, orographic obstacle of a mountain mass could be traversed by heavy rail roads. Earlier on, the imperial mountaineer Martin Conway envisaged a substantial impact of rail-traffic crossing the Karakoram mountains at the end of the 19th century: “... Gilgit must grow to be an important trade centre, and possibly, ... a railway junction on the line from India to Kashgar, where the Samarkand branch will turn off!” (Conway 1894: 144). At present, this seems to be a rather realistic scenario as Pakistan and the PR of China have agreed to cooperate in establishing a trans-Karakoram railway line. Work on the broadening of the Karakoram Highway has already begun for the implementation of enhanced communication through railway, road and pipeline. Winds of change are felt, and our judgment of different developments has to be linked to adjustments in space and time. Geopolitical considerations have to be taken into account when present-day developments are grounded in an historical context.

Generally speaking, the strategic importance of border-regions in mountain ranges has to be judged as the driving-force behind development of physical infrastructure. Two examples might suffice this point:

(i) Monumental roads were planned during World War II. British blueprints existed for the connection of Kashmir with Xinjiang in order to support the armed units of the Guomindang and their leader General Chiang Kai-shek. This primarily strategic enterprise aimed to provide military support against Japanese occupation forces in China and Mao Zedong’s Red Army. In addition, Soviet influences in Xinjiang were to be controlled; thus, a giant project involving 70,000 labourers and army staff was planned on the basis of nine million man-days within a span of one year for the section between Gilgit and Kilik Pass alone.2

Coinciding with the end of the war, this project did not materialize. After the lapse of half a century, this was the first serious attempt to realize the prognosis of Captain Medley uttered in 1896: “The road [Punjab-Kaghan-Chilas-Gilgit-Hunza-Kilik Pass-Yarkand] will in fact become the Grand Trunk road from Central Asia to India.”³ But the implementation needed further changes in the structure of regional politics. The major road-link between the Grand Trunk Road⁴ of South Asia (Fig. 1) and the Central Asian highways was only realized after Pakistan’s independence and the Chinese Revolution. Connecting the Grand Trunk road with the Southern Silk Road, its course was based on common strategic interests of friendly neighbours. The outstanding achievement to construct the trans-Karakoram axis is more remarkable, considering the lack of appropriate road infrastructure in Pakistan as a whole.⁵ Thus, the Karakoram Highway (KKH) has become not only a symbol of linking two major regions of sub-continental dimensions and two historical road-networks, but also an effective tool for growth- and exchange-related regional mountain development. The importance of the mountain passage will grow in the future rather than diminish. The vital role of the Karakoram Highway as a North-South transfer corridor is an expression for changed routes of goods transport and mobility of the peoples.

(ii) The Ledo Road from Assam to Kunming in China was constructed during World War II. The idea was to supply essential military goods from British India


⁴ The Grand Trunk Road is the colonial term for the “metalled road” which followed the Moghul time road connection from Kabul via Peshawar to Lahore, Delhi and Kolkata. It ist he most important road connection in the southern foothills of the Himalayan belt across the Khyber Pass and linking the Indus plains with the Gangetic lowlands (cf. Fig. 1).

⁵ Zaidi (1999: 384) assesses the current situation: “Compared to other underdeveloped countries, Pakistan’s road density of 229 km per million persons is very low, and even countries with half Pakistan’s GNP per capita, have a greater density. With 165,000 km of roads, Pakistan’s density of 0.21 per sq. km is much lower than the 0.51 km suggested for underdeveloped countries. Moreover, only 18 per cent of paved roads are said to be in good condition, again, a very poor figure by any standard.” Cf. for the developments in the Karakoram mountains Kreutzmann 2006b. Nevertheless, the state of strategic roads has changed tremendously in recent years.
to Upper Burma and Yunnan province of China. It was intended to serve two purposes. Again, supplies were meant to support the armed units of the General Chiang Kai-shek in the Southern China. But, a second purpose was to supply British and American troops in Upper Burma and especially Kachin State to fight-off Japanese military advances and excessive exploitation of the valuable colony. In addition, the Burma Road into Shan State was hastily constructed. Both roads lost their importance after the independence of India and Myanmar. Only recently, road-building companies from PR of China reconstructed the Ledo Road section in their borderlands. India has announced interest in doing its part and opening new posts for trading in Assam and Nagaland. The Burma Road was developed by a national company called “Asia World” to become one of Myanmar’s most sophisticated highways, which is linking Mandalay with Mu-Se in China.

Fig. 1: Cross-border trade and communication in the Pamir-Hindukush-Karakoram-Himalaya
The folded map on larger scale is attached at the end of the document
The meaning and importance of roads might change in time. Between the first
dreams and their realisation in our time lay a period which is more character-
ized by the first mentioned notion. The establishment of borders has interrupted
the flow of goods. Especially, during the Great Game of the 19th century and the
Cold War in the 20th century, traditional forms of communication were gravely
affected by political and ideological confrontations. Disputes between neigh-
bours, conflicts about loyalties, international actors’ activities in expanding their
spheres of influence and subsequent ideological battles and military conflicts led
to a human-made communication barrier that seemed to be insurmountable and
hermetically sealed-off. In order to understand the recent improvements of cross-
boundary cooperation in some sectors and the persisting confrontations in oth-
ers, we need to look into the emergence of conflict constellations and the forma-
tion of nation states. The latter sometimes remained an attempt and had to be
subordinated to the wider interest of powerful actors. The international bounda-
ries created during the “Great Game” have shown a surprising persistence and
durability until the present day. Nevertheless, their sheer existence provides no
tranquillity and peace. On the contrary, boundaries seem to be one of the main
objects of dispute. In this paper, an attempt is made to give equal importance to
the geopolitical confrontations in Western and Eastern High Asia.

2 Geopolitical Context of Exchange in Western High Asia

In Russia, the Gorchakov Memorandum of 1865 marks the beginning of the
animated phase of the “Great Game” (cf. Fig. 2). The metaphor “Great Game”
encompasses the colonial and imperial rivalry of the Great Britain and Russia
in Central Asia. Some authors stretch the bi-lateral confrontation and mutual
conflict over a long period from the early 17th to the mid-20th century (e.g. Fraser-
is about territorial control and boundary-making in Central Asia. The race for
dominance heated up in the second half of the 19th century. In 1872, the British
Premier Disraeli responded to Russian advances in his famous speech at Crystal
Palace in which he announced the imperial policies for expansionism. Immedi-
ate results were the “forward policy” in the Afghan borderlands and the subse-
quent crowning of Queen Victoria as Empress of India (1877). Russia and Great
Britain fought this game in the remote mountains of the Hindukush, Karako-
ram and Pamirs where their spies-cum-explorers met in unexpected locations.
At the same time, there was competition among the diplomatic staff posted in
Central Asian centres. Notably, Kashgar became one of the hotspots of confron-
tation where a weak Chinese administration was challenged by influential and active contenders.

The “Great Game” in its narrow definition came to an end in 1907 without any military encounter or substantial loss of British and Russian lives. This statement does not necessarily hold true for the regional residents concerned. Both contenders came to terms and consented to the text of the so-called Anglo-Russian Convention in which respective spheres of influence, buffer-states and regions of non-interference were agreed upon (cf. Fig. 3). Instrumental for the accord was the “heartland theory“, which drew geopolitical significance towards Central Asia.
In 1904, the geographer Halford Mackinder formulated his “heartland theory”, which became one of the most influential texts of the geopolitical debate until today. Mackinder drew prime attention towards Central Asia, as he stated that the Tsarist regional dominance was linked to the equestrian tradition from nomadic Asian backgrounds. From the safe retreat of the Inner Asian steppe regions, conquests had taken-off towards Europe, Persia, India and China. He described the European civilization as the result of a secular battle against Asian invasions (Mackinder 1904: 423). The naval predominance of Great Britain and imperial control of the world trade had been modified through a shift in terrestrial traffic structures. The Russian railways were perceived as successors of the equestrian mobile forces. Central Asia had become the arena of contest, all the more as a Russo-German and/or a Sino-Japanese alliance could contribute to a shift of world affairs to the “heartland” of the Eurasian continent, which he perceived as a “geographical pivot of history” (Mackinder 1904: 436). He predicted the transformation of Central Asia from a steppe region with little economic power into a region of prime geo-strategic importance. Culture and geography would contribute to the key region. Mackinder identified four adjacent religions encompassing the heartland of “pagan” Turan in the shape of a crescent and denominated by religious affiliations: Buddhism, Brahmanism, Islam and Christianity (Mackinder 1904: 431).

Similar ideas of a Central Asian “heartland” or a pivotal role stimulated Owen Lattimore’s perceptions in his book “Pivot of Asia” (1950). Keeping the experiences of World War II in mind, Lattimore drew a circle with a diameter of 1000 miles around Urumchi and identified Central Asia as a “whirlpool” stirred-up by “political currents flowing from China, Russia, India and the Middle East” (Lattimore 1950: 3). Following the same Central Asian-centred approach, Milan Hauner shifted the centre in the 1980s to Kabul; and drew a similar circle and identified a world of “even greater contrasts“, which “touches upon the volatile and oil-rich region of the Middle East” (Hauner 1989: 7). The last statement has remained valid through the dissolution of the Soviet Union, the Taliban rule in Afghanistan, and the Iraq crisis in the aftermath of 9/11. The fact that Ahmed Rashid (2000) subtitled his book on the Taliban as “Islam, Oil and the New Great Game in Central Asia” is the only case in point for reference to the “Great Game”

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7 With the passage of time Mackinder modified his theory under the impression of events during the First and Second World Wars and influenced the thoughts of Karl Haushofer and other “geopolitical” protagonists of his time.
connotation of contemporary geopolitical problems in the region. The presence of American and Russian troops at airports and along borders in Central Asia proves the continuing geopolitical significance of the region and its linkage to contemporary crisis zones.

What are the effects of certain lines of thought and resulting political actions on Central Asia and why do we still refer to the metaphor of a “Great Game” when discussing contemporary strategic interference and socioeconomic transformations in geopolitical contexts? Boundary-making and its impact on nation-building and politico-economic participation strongly influenced socioeconomic developments in the mountainous areas of Central Asia. Some cases in point need to be introduced for the understanding of the far-reaching consequences of imperial-border delineations. First of all, the practical impact on trade relations and economic exchange needs to be investigated.

3 Effects of the “Great Game” in High Asia

The “Great Game” resulted in the demarcation of international boundaries in High Asia and the separation of the superpowers of the time. Their spheres of influence did not touch each other. Russia and Great Britain exercised direct control and domination in the core areas of their respective empires. At the periphery, they had created buffer states such as Persia and Afghanistan (Fig. 3). During their negotiations, Kashgaria or Eastern Turkestan (which was nominally under Chinese administration) did not feature prominently. Trade between South and Central Asia was affected by this constellation. A rivalry had developed since British commercial interests entered this sector in 1874 (cf. Davis & Huttenback 1987; Kreutzmann 1998). Both contenders fiercely competed for dominance on the valuable markets in the urban oases of the Silk Road such as Kashgar and Yarkand. According to the theories of imperialism and unequal exchange, the merchants of the industrializing countries tried to purchase raw materials such as cotton, pashmina wool and hashish, while in exchange they offered textiles and manufactured products in the bazaars. Russia had some advantage as access was easier. From the railhead at Andijan in the Ferghana Valley, which was linked to the Middle Asian Railway in 1899, the distance to Kashgar (554 km) could be covered in twelve marches via Osh, Irkeshtam, and Ulugchat by crossing only one major pass, Terek Dawan (3870 m). By contrast, trade caravans from British

India had to follow one of three trans-mountain passages – the Leh, Gilgit, and Chitral routes – which were much longer and more difficult.

The competition for the Central Asian markets continued after the October Revolution, which caused the closure of the Russian/Soviet Consulate in Kashgar from 1920–1925. This event affected Soviet commerce with Kashgaria detrimentally, while the British share soared (Fig. 4). Overall, trade significantly declined due to the disturbances in Chinese Turkestan after 1935 and later due to World War II and the Chinese Revolution. Central Asian trade became an important factor in cross-boundary relations affecting the economies in the regions traversed for a period of forty years. The total annual volume of Indo-Xinjiang commercial...
exchange surpassed the two million rupees level for most of the era between 1895 and 1934 (cf. Fig. 4).

British interests in securing a substantial share in this commercial exchange governed their imperial designs and had an impact on the mountain societies involved. At the turn of the century, Ladakh and Baltistan were dominated by the Maharaja of Kashmir, Gilgit had become an agency (re-established in 1889) under the joint administration of a British Political Agent and a Kashmiri Wazir-i-Wazarat. Principalities such as Hunza and Nager were affiliated after their defeat in the 1891 encounters during the “Hunza Campaign”, which were fought under the pretext of opening the Gilgit route for commercial purposes. At the
same time the Mehtar of Chitral transferred his sovereignty in external affairs to a British Agent and was remunerated with an annual subsidy and a supply of arms (Kreutzmann 1998).

The Western wing of High Asia was controlled and de facto commercially incorporated in British India’s exchange system. Trade with Afghanistan followed its own rules and became part of the special arrangements with the ruling Amir in Kabul. The major hiatus occurred in the aftermath of the October Revolution when a process of separation and isolation began. The economic relations of the Soviet-dominated Central Asian regions were re-directed and amplified towards Russia, while at the same time international borders were sealed and became effective barriers to trade. This process took time and lasted until the mid-1930s. With growing alienation between the Soviet Empire and the Chinese-dominated part of Eastern Turkestan, a nearly complete interruption of exchange relations between Tajikistan-Kyrgyzstan and Kashgaria came to a halt by 1930 (Kreutzmann 1996: 179). The undercutting of bazaar prices through the provision of cheaper commodities of the same quality in kolchoz shops led to the termination of trade in this sector. Similar developments took effect on the Soviet border with Afghanistan during the 1930s: “During the past few years, the effect of Soviet policy has been to restrict, in an increasing degree, traffic, excepting state-controlled trade, from Soviet Central Asia across the Afghan frontier on the River Oxus. ... more European Russian officers have been appointed to ensure that the frontier is effectively closed”\(^\text{10}\). The archival material provides substantial evidence that by the mid-1930s, borders became efficient as tools of closure, thus interrupting cross-border exchange.\(^\text{11}\) The phase of diminishing exchange relations across borders lasted until the end of the Cold War in most sectors where the Soviet Union and PR of China were involved on one side and Afghanistan, Pakistan, India,


\(^{11}\) IOL/P&S/12/2274: India Office Library and Records: Departmental Papers: Central Asia. Reports on Russian Turkestan. While different reports attempt to compare prices for major commodities such as wheat flour, rice, cotton seed and meat between major trading centres such as Andijan, Osh, Tashkent, Pishpek (Bishkek) and Kashgar it sometimes seems to evade those reports that a new period has started in Soviet Central Asia. The report writers still expect around the mid-1930s that private trade across borders might commence again in a matter of months.
Nepal, Bhutan and Myanmar on the other. With few exceptions, traditional trade links and exchange routes were interrupted for two generations. Only recently has cross-border exchange gained momentum, and negotiations about infrastructure development, trade and mobility have been speeding up.

4 Effective boundary-making in Western High Asia

Mountain regions have been involved in the demarcation of spheres of influence and affected by border-delineation. The establishment of competing socio-political regimes characterized mostly international relations during the 20th century. The same occurred in High Asia. The contenders of the “Great Game” in High Asia agreed to lay-down boundaries in the comparatively sparsely populated regions of the Hindukush and Pamir. Sometimes, these borders were described as natural-frontiers, scientific-boundaries and dialect-borders. The Durand Line of 1893, separating Afghanistan from the then British India, epitomizes such an effort. Prior to the demarcation, British troops encountered more than 46 battles with Pashtun “tribes” in the span of as many years. 12 The Durand Line has continued to function as the symbol of discontent, dispute and colonial border-delineation referred to as the “dividing-line” (Felmy 1993). In order to safeguard the physical separation of two imperial opponents, international borders were outlined and Afghanistan was created as a buffer-state. Local livelihoods and regional interests were neglected and were of secondary importance. The Pashtun settlement region was divided into two parts following an arbitrary line through the Hindukush ranges (Fig. 5).

12 Cf. Davies 1975; Jaeckel 968.
The traditional migratory paths of seasonal nomads between the Central Afghan-
istan highlands and the Indus lowlands were intersected along the Hindukush
passes. Numerous clashes between tribal groups and imperial troops in the bor-
derlands characterized the political relations in the frontier that served as a buffer-
belt on the fringe of the empire (Fraser-Tytler 1953). Now, a special legal status has
been assigned to these regions (Fig. 6), that are administrated as Federally or Pro-
vincially Administered Tribal Areas (FATA or PATA). The movement of nomads
(powindah) and their herds now depends on bi-lateral political relations and has
been restricted, but has not ceased. Presently, these border regions are again the
cause of strained diplomatic relations between Afghanistan and Pakistan.

Fig. 5: Afghan borderlands – historical roots of disputes
Fig. 6: Areas under dispute between India and Pakistan
The Wakhan Corridor’s southern limit is formed by the Durand Line while the northern part came into existence as a result of the Pamir Boundary Commission of 1895 in which Russian and British officers negotiated the alignment. Afghan officials assisted in the demarcation, but were not actors in the deliberations. The local residents were significantly affected and their survival strategies had to be adapted to changed circumstances. The narrow 300 km-long and only 15–75 km wide corridor was created to separate Russian and British spheres of influence and fulfilled the function to avoid direct military action between the two superpowers of that period and region. Part of the boundary follows the course of the Panj Darya (Amu River), which was in accordance with the fashion of the time. The “stromstrich” boundary followed a role model previously tested in other regions of the world.13 The price for this colonial endeavour was the spatial partition of regional semi-autonomous principalities such as Badakhshan, Darwaz, Wakhan, Shughnan, and Roshan. Subsequently, both parts of each former principality experienced quite diverse socio-economic developments as part of greater political entities. Today, we find regional units of the above-mentioned toponyms in Afghanistan and Tajikistan. The creation of these boundaries resulted in immediate refugee movements by ethnic minorities.

In recent years, relatives separated by a century-old border, have re-established their relationship, and the bridges across the Panj River in Langar, Ishkashim and Khorugh symbolize those endeavours. The Langar and Ishkashim bridges were built to enable the Soviet army to invade Afghanistan (1979) and to safeguard their supplies from the Soviet Union for the control of Badakhshan. Meanwhile, the function of the Ishkashim Bridge has changed. For years, during the war in Afghanistan, support for the Northern Alliance and humanitarian-aid for the suffering civilians were transported across this bridge. The island in the river near Ishkashim became a storehouse for humanitarian-aid such as wheat flour, milk-powder and vegetable-oil. Presently, every Saturday, a border-market takes place on the island.

The Khorugh Bridge at Tem was built by AKDN in order to link the cut-off Afghan Shughnan region with Tajik Shughnan and to establish a market access. More bridge projects are planned along the course of the Amu Darya while another was opened in Darwaz already. Nevertheless, the effect of partition is felt in all areas, especially when international borders are closed and strictly controlled.

12 Cf. Aitchison 1909, 1929; Alder 1963; Lamb 1964; Woodman 1969
as has happened since the Cold War. Afghan Wakhan is suffering substantially from its dead-end location, lacking through-trade and exchange with neighbours (Felmy & Kreutzmann 2004, Kreutzmann 2003, 2007). Similar observations are valid for Shughnan and Roshan. Both parts on the Afghan side are cut-off from communication by heavy snow on the Shewa Plateau from autumn to spring. Bridges across the Panj ease their exchange with Tajikistan significantly and are bridges to supply markets.

4.2 Irredentism about Pashtunistan

All international boundaries of Afghanistan carry a heavy weight for disputes with neighbours and are the cause for minor and major skirmishes. Probably, the most prominent border dispute is the irredentism movement for “Pashtunistan”. This struggle is still alive and mainly fought along diplomatic and political lines. One of the main squares in Kabul has continued to be named after this Pak-Afghan dispute, which has heated up regularly since the 1960s. The Afghan demand for a territory named Pashtunistan (cf. Fig. 5) consisting of the Pakistan North-West Frontier Province (NWFP) and Baluchistan (including the tribal areas), which is the result of the imperial design that led to the creation of the Durand Line and the referendum at the end of British Rule in India. Pashtun representatives have taken these incidents for their mobilization of people for the cause of Pashtunistan. Imperial legacies and losses function as a measure of identity and supply the ideological platforms for charismatic leaders who mobilize their followership in order to re-write history. The Durand Line, as an acknowledged or disputed international boundary, has been a cause for discontent and political crises between the neighbours, Afghanistan and Pakistan, and will most probably remain so in the future. In the summer of 2007, when the diplomatic relations between both neighbours were strained, the respective armies were again on high alert.
4.3 China’s boundary with Afghanistan and Tajikistan

The short Sino-Afghan boundary rounds-off the slim buffer belt of the “Great Game”. In the context of China’s border with the former Soviet Union, this alignment is part of a disputed frontier. According to Chinese opinion, their border with Afghanistan and Tajikistan extends much further west while the factual contemporary boundary is agreed on by the China’s neighbours. Although, claims to disputed territory differ substantially, China and Tajikistan are factually separated by a highly visible structure: the systema, a barbed-wire fence which forms a present-day buffer of neutralized territory. The Kirghiz animal husbanders of this border region suffer from loss of accessible pasture due to the buffer arrangements (Fig. 7). Only by a written permission (propusk), they were allowed to cross into the neutral zone. Recently, China and Tajikistan agreed that
an area covering app. 976 km² should be handed over to the mighty neighbour. The affected herdsmen of the Rangkul community (jamuat) are more than disappointed about the loss and the prospect of no compensation for the expropriation of valuable pasture land.

All these borders formed an integral part of the major global divide after World War II. The frontlines of the Cold War followed their historical predecessors. Western and Eastern alliances, as well as neutral states like Afghanistan (up to 1978) and the independent anti-Soviet path of Chinese communism (since 1958) met in the Pamirian knot. Consequently, a remote mountain region became a meeting-point of competing political systems with detrimental effects for the local residents.

The post-Cold War alleviation of this confrontation did not terminate any military action in the region. The Pamir Boundary presently separates the newly independent state of Tajikistan (since 1991) from Afghanistan. Until recently, Russian soldiers patrolled the border; for the last few years the Russian soldiers have been replaced by Tajik forces. In the aftermath of 9/11, the sensitive boundary has attracted renewed attention. The previous global confrontation has been replaced by regional conflicts. Nevertheless, these examples are not singular cases. Nearly, all borders of the Hindukush-Himalayan arc are under dispute by one or the other side.

4.4 Border disputes within the Soviet Union and among post-Soviet independent states

The aim of Soviet nationalities’ policies was to create new republics, which were intended to represent the ethnic groups of Central Asia in adequate spatial and administrative settings. Consequently, by 1929, ethnonymous republics were created to represent Kazakhs, Kirghiz, Tajiks, Uzbeks and Turkmens. The new republics did not have any boundaries in common with their predecessors, the Khanate of Khiva, the Khanate of Bukhara and the Turkestan Governorate-General. If the term “artificial boundaries” could be appropriate in any context, it would be here. The newly defined republics consisted of a spatial nucleus, but very often they had in addition satellite territories of enclaves and exclaves within the territory of neighbouring republics. While this phenomenon did not pose grave differences during the period of the Soviet Union – basically all territories were under the central command of the Kremlin and only international boundaries with neighbouring countries such as China and Afghanistan were of any importance and hermetically sealed – another cause of germinated dissent erupted
after independence in the early 1990s. Republican boundaries within the Soviet Union became international borders of sovereign states such as Uzbekistan, Tajikistan and Kyrgyzstan. In a survey, two years after independence, the Moscow Institute of Political Geography recorded 180 border and territorial disputes in the aftermath of the dissolution of the Soviet Union (Halbach 1992: 5). Central Asia was no exception in this regard; and since then, these conflicts have increased. According to a recent report of the International Crisis Group (ICG 2002), there is no Central Asian country without border disputes with its neighbours. To illustrate, the scope of conditions and demands in a few cases are listed: Irredentism movements in Turkmenistan, expect Uzbekistan to “return” the territory of the Khanates of Khiva and Khorizm. Tajik nationalists demand the “return” of Samarkand and Bukhara. Uzbekistan lays claim to the eastern part of the Ferghana Valley, i.e. the Osh Oblast, the present-day economic and commercial centre of Southern Kyrgyzstan. The Uzbekistan government does not permit colleagues from neighbouring republics to consult the archival material in Tashkent, which documents the boundary decisions from the 1920s. Rental arrangements and the production of natural resources in exclaves from Soviet times are under dispute such as the Uzbek exploitation of oil and gas fields in Southern Kyrgyzstan and the deviation of irrigation water from the Andijan reservoir towards the Ferghana Valley (UNDP 2006: 88). The Ferghana Valley alone contains seven enclaves through which major traffic routes are leading. Freedom of travel is more restricted than before as new measures of visa regulation of travel were introduced. Some of these measures have been justified in the aftermath of attacks from Afghanistan-trained rebels, who plundered Tajik and Kirghiz villages on their way to the Ferghana Valley in 1999 and 2000. The future of rented-lands and enclaves that were created for the protection of ethnic minorities is at stake and neighbouring governments discuss options for forced evacuation and migration to initiate population exchange. Only in the framework of the Shanghai Cooperation Organization’s (SCO) summit held in Bishkek in August 2007 travel regulations between Kyrgyzstan and Uzbekistan were eased for residents of the border areas.

5 China and South Asia

In accordance with their recovered importance in global politics, the Earth’s two most populous countries have been attempting to agree on a solution to long-smouldering boundary conflicts. In Eastern High Asia, China and India are two powerful neighbours whose disputes about the delimitation of internationally
legal borders are due to colonial demarcation of spheres of influence as well as to postcolonial factors. Nepal, Sikkim and Bhutan were small Himalayan buffer monarchies on the periphery of British India, while Tibet was a special case, attracting covetous neighbours because of its size and wealth. The North-East Frontier Agency completed the buffer zone, which stretched eastward via the Naga Hills from China into British-dominated Burma.

After India and Pakistan became independent and the Chinese revolution had reached the Himalayas and Tibet (and annexed the entire territory), India and China went to war in 1962, with heavy casualties on both sides. The two great powers of the region endeavoured to strengthen their leadership claims and to revise what they considered unjust colonial interventions. Whereas, it is easy to grasp the large-scale constellation of power politics, the small-scale picture is fraught with problems and sometimes serious repercussions. The aim here is to elucidate the long-term impact of the colonial legacy on international boundaries and trade, to consider the regional consequences in Eastern High Asia, and to assess future perspectives. The outcome was that the war was followed by a phase of stagnation and confrontation between China and India. China and Pakistan reached an early compromise, which resulted in friendly relations. India refused to accept an exchange of territory and, in the context of the Kashmir conflict, demanded the return of Aksai Chin, whereupon China insisted on its claim to Arunachal Pradesh (Kreutzmann 2002, Lamb 1964, 1968, Woodman 1969). Only recently first tentative steps have been made towards mutual concession and amicable compromise.

5.1 From Tibet to South Asia

In the summer of 2006, a dream came true. For the first time, modern trains crossed the “Roof of the World”. Chinese engineers have succeeded in doing what British railway builders already dreamt of in the 19th century: that is, overcoming the barrier of the steep Himalayan arc. What Kenneth Mason (1936) had perceived as a barrier to modern communication had fallen. Yet, the engineers envisaged and drew blueprints for a rail link between Central Asia and India’s transport network. When Chinese geographers presented different routes for linking the Chinese and Indian railway networks at an international conference in Xining seven years ago, foreign observers only shook their heads in disbelief. In the meantime, an important step has already been completed at breathtaking speed: modern railway stations have been built at Kashgar and Lhasa, and hindrances to crossing the deserts of Inner Asia and the permafrost soils
of Tibet seem to have been conquered. Even, high passes, such as the above-5000 m high Tanggula Shan, are merely challenges to be overcome by the engineer’s art. Recently, an extension of the railway line from Kashgar to Pakistan was announced; Xigaze and the Nepalese borderland are to be connected to the Tibet Railway in due course.

Further, groundbreaking developments are occurring in the same breath. The reopening of Nathu La\textsuperscript{14} Pass (4545 m), as a trade route between India and China, is a reminder of traditional trade roads (Fig. 1). The Cold War, and the continuing tension between India and the People’s Republic of China over their shared Himalayan border, had disrupted trade and closed the pass after the border conflict of 1962. Now the walkable and motorable road network in the thinly populated Himalayas is expanding, and business partners are linking modern infrastructure and technology with traditional trade; and exchange relations. In the past, valuable loads of salt, brick tea, and \textit{pashmina} wool were carried over the passes; but, nowadays, trucks carry consumer products and bulk goods.

Roads are symbols of modern development; even more so, now they have supplemented or superseded railways as the major mode of transport (Ispahani 1989, Kreutzmann 2004). In the past 50 years, opening up remote areas has mainly been considered to be a prerequisite for access to development opportunities, even if the driving motives were of a military and strategic nature. A market-economy, modern-administration, health and education facilities, and mobility and migration generally count as unthinkable without a connection to interregional, national and international communication networks. Only regions with a well-developed infrastructure can compete in the global market. Nevertheless, the common development indicators show that the gap is visibly widening between more or less integrated and peripheral regions (Kreutzmann 2006a). Mountainous areas tend to belong to the periphery. Especially, the Third World mountain ranges exhibit serious infrastructural deficits and regional disparities. In the heart of Asia, some radical changes are likely in the future. For a better understanding of regional boundaries and future potentials, it is necessary to take a closer look at the geopolitical configuration of spheres of influence and areas of dominance.

\textsuperscript{14} Nathu La is the important pass in Sikkim connecting India and China from Gangtok to Gyangze (cf. Fig. 1).
5.2 The Great Game in Eastern High Asia

In the 19th century, the colonial ambitions of British India and the Chinese Empire threatened to end in a confrontation of the regionally dominant territorial powers that was later superseded by the Great Game, with Russia, as the rival power as discussed above. Conflicting interests had a wide-reaching impact on the minor players and the local population. Political borders – almost all of which still exist – are effective spatial manifestations of how imperial spheres of influence were staked out in High Asia. The principle of indirect rule was applied by establishing compliant ruling dynasties. Hence, these interventions have often been interpreted in the context of safeguarding the “Jewel in the Crown” (cf. Kreutzmann 1997). While, the north-western part of the frontier was highly contested the developments in the centre and the south-eastern section took different turns.

6 Nepal, Sikkim, Bhutan: buffer states of different order

In the eastern Himalayan belt, a strategy was pursued to give a certain degree of independence to the principalities (or what was left of them after the treaties had been signed). In 1816 the treaty of Sagauli was signed with Nepal, guaranteeing Nepal’s neutral status in the area between the Mahakali and Mecchi rivers (Fig. 8), after Garhwal and Kumaun in the west, parts of the Terai in the south, and Darjeeling in the east had been withdrawn from Gurkha control and placed under colonial administration (Burghart 1984, Choudhury 1996, English 1985, Lamb 1964). British India sent a Resident to Kathmandu, secured itself an option to recruit Nepali mercenaries, and determined the fortunes of Nepal’s foreign policy whilst conceding independent trade and domestic policies. Incorporating Nepal permanently into the Empire appeared to be too expensive, especially as Nepal also by then had formal relations with China. Great Britain and India’s arrangements to employ Nepali citizens as mercenaries still continue up to the present day: Gurkha soldiers protect Queen Elizabeth II in Buckingham Palace, and there are Gurkha contingents in the Indian army.
Further, developments were determined by commercial interests in establishing plantations to grow “colonial produce” and exploiting tropical woods in Burma (Myanmar). The north-east was turned into a competitive tea-growing region outside China: Assam fell to British India in the aftermath of the first Burma war in 1826. Other important tea-cultivation areas included Darjeeling and Cooch Bihar, which Sikkim and Bhutan were forced to relinquish (Fig. 8). After further armed conflicts, Dewangiri and the Duar (Himalayan foreland) were also ceded to British India in 1865 before peace treaties secured a large measure of autonomy and self-rule for the remaining territories of Bhutan and Sikkim.

Intervention in internal policies, regulating succession to the throne and the founding of dynasties, was instrumental in creating reliable political connections. In 1907, the election procedure was abolished that had previously made the Deb Raja primus inter pares among the penlops (governors of territories) in Bhutan. The Deb Raja’s function was to represent Bhutan’s interests in external affairs. This office had hitherto been held by different penlops; now, with British backing, a right of succession was established (Collister 1987, Gupta 1974, Rustomji 1973). The first Druk Gyalpo, Sir Ugyen Wangchuk, founded the dynasty of the
penlops from Tongsa. This British-created dynasty still rules Bhutan. Since 1963, his successors have borne the title of king. Jigme Singhi Wangchuk, the fourth ruler of this dynasty, has been king since 1974 and plans to relinquish his power to a parliament in the coming year. The monarch’s principle of “Gross National Happiness” (GNH; cf. Rinzin 2006) intended to make Bhutan a model eastern Himalayan country. The implementation of a unique model was bought at the cost of depopulating entire areas and displacing more than 100,000 people since the early 1990s. These groups, who called themselves Lhotsampa, were stigmatised and expelled, as “Nepalese” and victimised in a campaign against immigration that also targeted other autochthonous citizens and groups (cf. Dhakal and Strawn 1994, Rizal 2004). Today, Bhutan puts the Buddhist majority culture at the centre of development efforts and has isolated itself from the outside world, while the refugees mark time in eastern Nepalese refugee camps and negotiate with the US about a third-country regulation. Bhutan’s borders are neither clearly demarcated nor undisputed. Cooch Bihar (3400 km²) was incorporated into Bengal during the British period; the Dewangiri District (83 km²) was returned to Bhutan after India became independent (Fig. 9). Since 1984, Bhutan and China have been negotiating the exchange of an area smaller than 1000 km² (Schweinfurth 1993, p. 279; Smith 2004, p. 142).

These Himalayan countries survived as independent entities except for Sikkim, which was annexed by India in 1975 and incorporated into the union. Nepal and Bhutan have close exchange relations with the British Empire’s dominant successor state in this region, but they are endeavouring to maintain an independent position between India and China.

7 Tibet – the dilemma of statehood and the prolonged strife for autonomy

The attempt by the 13th Dalai Lama (1876–1933) to make use of the global political situation (the Great Game rivalry between the great powers, also a comparatively weak Chinese Qing Dynasty) to achieve a sovereign state was ultimately doomed to failure. Rivalries between Russia and Britain included Tibet in their power plans for Central Asia as long as the imperial court showed only minor presence in the lamaist “feudal theocracy” (Dabringhaus 1994, p. 67); and limited itself to controlling Tibet’s external relations. Both influential powers were attempting to dominate the pashmina wool monopoly and other trade activities. Whereas, Nepal was able to secure trade privileges in Tibet in the mid-19th century already, a British trade mission led by Colman Macaulay 1876 failed in the
face of Tibetan resistance, although the Qing government had allowed similar rights to Britain (Lamb 1968: 134–142). It was only when the Great Game came to a head that the power politician Lord Curzon acted on his own initiative and sent Francis Younghusband on a pre-emptive advance mission to Lhasa with a 8000-strong force disguised as a border commission. Causing heavy losses on the Tibetan side, the party obtained entry to the “forbidden city” in 1904, and the Dalai Lama took refuge in Mongolia. Despite the military success of the “forward policy”—accompanied by unprecedented raids on Tibetan monasteries—the British government refrained from permanent occupation of Tibet (Carrington 2003, Dabringhaus 1994: 74; Lamb 1960, 1966). Just one year before the Asia Convention was signed, Britain and the Chinese imperial courts agreed in the bilateral treaty of 1906 that says: “The Government of Great Britain engages not to annex Tibetan territory or to interfere in the administration of Tibet. The Government of China also undertakes not to permit any other foreign state to interfere with the territory or internal administration of Tibet” (quoted by Goldstein 1989, p. 827–828; cf. also Norbu 1992, Shaumian 2000). In the long term, this agreement and further concession—specified by both Great Game powers in the Asian Convention— to recognise the “suzerainty of China over Thibet” (quote in Goldstein 1989, p. 830) sealed the fate of an attempted uncoupling of Tibet’s sovereignty from all great powers. Although, the 1911 republican revolution in China allowed the proclamation of an independent Tibet in the following year, but the Red Army’s invasion in 1951 ended the existence of the “lamaist state” (Goldstein 1989), without any appreciable internal consolidation of the state structure or international recognition having been achieved in the meantime (Dabringhaus 1994, p. 78). Plans to achieve Tibet’s independence from China had failed, and the 14th Dalai Lama’s struggle for autonomy within the People’s Republic of China is presently being conducted from his Indian exile in Dharamsala. Presently, it seems as if the Dalai Lama acts as a broker between his own followers and the Chinese Government. The positions of the latter are wide apart, while the intermediary tries to find some common ground to negotiate a peaceful solution.
annexed Bhutanese territory during British times

annexed by India

claimed by PR of China

refugee and migration flows

separatist movements

demands for regional autonomy

regional movements for non-acceptance of Bengali immigrants

McMahon Line (Line of Actual Control)

border of conquered territories

Fig. 9: North-eastern India – from Assam to the Seven Sisters
Yet, even the term Tibet is not entirely unambiguous, because it refers to different territories depending on the speaker’s point of view (Fig. 10). The Tibetan government in exile stakes its claim to those areas that belong to Greater Tibet in ethnic and cultural history terms, including Amdo (Kokonor or Qinghai) and Kham (the regions under Chinese administration since the 18th century already), as well as political Tibet (U-Tsang). The former are autonomous districts and municipalities administered by the provinces of Sichuan, Gansu and Yunnan. An Inner Tibet would be comparable with the autonomous region of Inner Mongolia if it existed as a uniform territory (see Barnett (1994: xvi–xvii) and Goldstein (1994: 76–90) on this controversial debate). At present, only the Autonomous Region of Xizang – the political Tibet – is an administrative unit of the PR of China. As a traditional centre of power, it reflects the historical sphere of influence of sequential Dalai Lamas and their political ambitions. The example of Tibet illustrates the contradictory interpretation of fuzzy terms and a permanent conflict over withheld autonomy, denied self-determination and unacceptable territorial assimilation. In addition, relations between China and India are strained because, apart from the Dalai Lama, other dignitaries of Tibetan Buddhism and refugee groups have chosen exile in the Himalayan region of India. Whereas, the relationship of the dignitaries and the majority of the refugees to the Chinese presence remain tense and there are few signs of agreement, some Tibetan refugees have returned to Lhasa and Xigaze in the past few years. The economic upturn there and the political and economic crises in Nepal have motivated some Tibetan exiles to return to their own home or to that of their ancestors despite the lack of self-determination and freedom. The continuing repression in Tibet has led others to remain refugees or caused them to flee their country.

8 British dominance in Assam and in the North-East Frontier Agency

In the structure of colonial administration, the north-east of the subcontinent fulfilled a similar geopolitical function to that of the north-west *vis-à-vis* Afghanistan. In the eyes of British India, both regions were buffer-zones facing Inner Asia, and both contained so-called tribal areas whose loyalty was to be kept with a minimum of military expense and administrative effort. In both cases, they included valuable production-zones: in the northwest, the irrigated cotton fields and granaries of Punjab; in the north-east, the tea plantations of Assam and the rice and jute region of Bengal in the Brahmaputra valley.

The north-east region suffered fewer armed conflicts and casualties than the North-West Frontier Province on the border to Afghanistan. The North-East Fron-
tier Agency (NEFA) bordered on Tibet. The new entity was separated from Assam: both areas fell to British India in 1826 after the first Anglo-Burmese War (Treaty of Yandaboo). By 1885, after three wars, Burma finally came under complete control and was incorporated into the Empire as a supplier of teakwood.

From the “colonial bridgehead” (Stang 2002, p. 342) in Bengal, the British colonial empire expanded across the Indian subcontinent. From here, the first Christian missionaries entered Eastern High Asia, as did the so-called missions, punitive expeditions to “pacify” the “wild mountain tribes”. These prolific efforts resulted in communities that are still mainly Christian today (Fig. 11) and the highly conspicuous presence of missionary-led educational establishments in the
Union States of Meghalaya, Nagaland and Mizoram. The primary aim of these activities was to protect the Assam plains and their valuable tea-plantations.

The extent of administrative control decreased progressively from the centre of Assam to the Naga Hills: A directly administered-zone bordered on a contact area of partial administration, which in turn gave way to a non-administered frontier buffer tract (cf. Elwyn 1959, Schweinfurth 1993, p. 275). The North-East-Frontier Agency was subdivided by an Inner Line, showing administrative boundaries and travel restrictions, and an Outer Line, which provisionally indicated the effective international border. The goal was to strengthen this outer boundary and to control trade. The commercially valuable Tawang area in the west of the NEFA and along the borders with Bhutan was a hotspot of conflict. From the Tibetan perspective, the important trade corridor between Lhasa and Assam was Tibetan territory. Tawang was to play a key role in all the diplomatic negotiations following the 1907 Asian Convention. The British negotiator Sir Henry McMahon favoured a similar solution to that in Mongolia. Subdivision into an Inner
Tibet facing China and an Outer Tibet would take account of the declared will to create a buffer zone between China and British India. Outer Tibet would, thus, have become practically independent of China; and British influence in Tibet could have been maintained. All three parties failed to reach an agreement. In 1914, Britain unilaterally drew what was known as the McMahon Line which, in extension of the earlier Outer Line, showed Tawang as part of the NEFA on British territory (cf. Lamb 1964, 1966, 1989). In everyday life, the local population felt that they still belonged to Tibet and were responsible to authorities in Lhasa. However, British inspectors and tax officials tried to convince them otherwise. On independence, India inherited the Tawang dispute. None of China’s governments ever accepted this boundary line (cf. Fig. 9). This dispute was one of the factors triggering the war between China and India in 1962; and the border-issue has not been solved up to the present day, even after the ninth bilateral round of negotiations in 2007.

9 The aftermath of the Sino-Indian War

The impossibility of resolving existing boundary disputes (more than 2000 km long), shared-border and the estrangement between the two major powers in the postcolonial movement, pointed to an escalating conflict. In addition, in 1959, India granted asylum to the Dalai Lama on his flight from Tibet via Tawang to Kalimpong and had offered him an exile headquarters in Dharamshala (Fig. 10). In a short war that inflicted heavy casualties, China sought to settle the disputed boundaries. After India’s embarrassing defeat, China dictated the terms of the cease-fire of November 1962. China occupied all the disputed territories; in the west it controlled Aksai Chin, and in the northeast all Indian forces were expelled from Tawang and the NEFA (cf. Maxwell 1972). Given the outcome of the war, the terms set by Premier Zhou Enlai were surprising. The Chinese seemed to be primarily interested in continuing to control Aksai Chin, through which they had already built a road linking the Chinese provinces of Xinjiang and Tibet (Fig. 1). In return, and with no need to do so, China gave up the North-East Frontier Agency as bounded by the McMahon Line (that is, including Tawang). Although, India’s Prime Minister, Pandit Nehru, publicly rejected these terms, his tacit acceptance was relayed to Zhou Enlai through diplomatic channels. Hence, the victor controlled only one-third of the disputed territory – Aksai Chin – whereas, the loser kept control of the twice-as-large North-East Frontier Agency (Maxwell 1972). The heavy defeat had a variety of consequences in the Indo-Chinese borderlands. India built thousands of kilometres of mountain roads in Kashmir, Ladakh
and Himachal Pradesh in order to be prepared for future advances (Kreutzmann 2004) and pressed ahead to integrate NEFA into the Indian Union in the north-east. The annexation of Sikkim in 1975 heralded a new administrative structure in the north-east. In the early colonial phase, this region had been Assam alone and was later divided into Assam and NEFA. Today, it is one of the “Seven Sisters” in the Indian Union (Fig. 9). The troubled north-east, now, comprises seven union states. The state of Nagaland was established in 1963 already. Yet, this administrative act in no way helped to end the unrest and the sometimes armed fight for independence from India. Assam was divided up even further: the Garo, Khasi and Jaintia Hills being joined to form the state of Meghalaya in 1972. This was followed in the same year by Tripura and Manipur, which were awarded the status of union states, as were the Lushai Hills in 1987, since known as Mizoram. However, there is unrest in these newly created administrative entities. Not only internal opposition groups, but also leaders of separatist movements in exile are demanding either more autonomy or independence from India’s central government. In the last territorial reorganisation for the time being, the colonial term North-East Frontier Agency (NEFA) was abandoned, the new state being known as Arunachal Pradesh since 1988. The majority of the Seven Sister States are among India’s problematic and troubled regions (Fig. 9). In Assam, a crisis has long been smouldering between “autochthonous” Assamese and immigrant Bengalis, which is leading to political polarisations and unrests involving many casualties. Student organisations, the United Liberation Front of Asam (ULFA) and the Bodoland Movement keep this conflict alive; although, efforts to achieve a compromise have been under way for some time. For years, the local and multinational owners of Assam’s tea-plantations have put the blame for unprofitable production on the unrest. However, their critics regard the actions as necessary attempts to improve the working conditions of the women tea-pickers, most of whom come from Bengal, Jharkand and Orissa. In Meghalaya, Nepalese and Bengali immigrants have openly been threatened recently with attacks and expulsion, causing many of these workers to leave. Population mobility, identity conflicts and separatist efforts are fuelling permanent confrontations between representatives of interest-groups and state institutions; and dimensions of these conflicts go beyond domestic politics owing to trans-border support by other parties to the conflicts (cf. Rizal and Yokota 2006).

In the latest “State of the States” report (India Today 2006), the Seven Sister States (SSS) are in the bottom third in the agricultural and security sectors and often bring up the rear, like Assam in arable farming. The north-eastern states also lag behind the national average, as regards infrastructure and investment
environment. Sikkim and Mizoram are the exceptions. Better rankings were achieved only in education and health. Overall, this is a reflection of the precarious domestic political situation.

11 Conclusions

In our tour de force along the mountain arc composed of the Pamirs, Hindukush, Karakoram, Kun Lun Shan and the Himalayas, we have seen that the presumptive barrier to communication forms a major link between Central and South Asia. Different expressions might be applied for the diverse situations and locations. The classical “Pass-Staat” concept could be attributed to some smaller states such as Hunza, Ladakh, Mustang, Sikkim and Bhutan. The role of Kashmir and Nepal as the major intra-montane basins allowed a wealth accumulation on a different scale. From this perspective, smaller entities could enjoy a function in cross-border exchange relations, which contributed to the improvement of living conditions within the mountain belt.

Geopolitical interest during the “Great Game” resulted in a modified perception of mountain regions. Transport facilities and trade infrastructure need to be interpreted within political contexts of dominance and power. Boundary-making for the sake of territorial domination puts mountain peripheries into the centre of imperial activities in creating spheres of influence and buffer zones. The results of boundary-making are legacies of independent nation states and are roots for bilateral clashes and confrontations. In the 20th century, a variety of actors perceived numerous neighbourly conflicts and staged violent acts in the mountain arena. The Cold War confrontation seems to having reached an end. Nevertheless, constraints for trans-montane exchange remain and tensions that attenuate and retard regional cooperation prevail.

In the beginning of the 21st century, we experience a re-emergence of mighty regional post-colonial powers that participate as influential counterparts in global exchange. The overall suspension is created by the major players China, India and Pakistan; while in the western section of High Asia, the effects of the dissolution of the Soviet Union and the conflict-prone recent history of Afghanistan modify the present situation. The geopolitical heritage of colonial boundaries and strained neighbourly relations has a major impact on local opportunities and creates constraints for a smooth path to sustainable development in High Asia. Cross-border communication and regional cooperation will pose the prime challenge for a peaceful future and mutual benefit of all participating stakeholders.
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2.2 Sustainable Mountain Development in the Age of Global Change: Regional Exchange and Collaboration in Europe and Africa

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Abstract

Planet ecology is dynamic and ever-changing. However, global change is occurring nowadays at the rates unprecedented in human history. This calls for broader and more collaborative sustainable development policies. After reviewing the impact of global change on fragile mountain ecosystems, this paper focuses on the role that regional exchange and collaboration (REC) can play in supporting sustainable mountain development (SMD). Two opposite geo-political cases are presented: the European Alpine region and the Fouta Djallon Highlands of Western Africa. The Alpine region case illustrates how a fifty year long REC process, rooted in the “post-industrial” socioeconomic and cultural transformation of European society and supported by high-level political lobbying activities has resulted in a “subsidiary” political platform, which binds the governments to respect SMD principles in their policies and governance by-laws. The Fouta Djallon case shows how a REC process for SMD can be developed in a context in which national governments have limited capacity to address the vicious cycle linking extreme poverty with environmental degradation. In this setting, a Global Environmental Facility (GEF) project has adopted a two-pronged programme format, with one programme component focusing on capacity building and awareness raising for REC, and other components addressing livelihoods, natural resource management and social mobilization issues at the grassroots level. The paper concludes that there is no single way to promote regional cooperation in mountain areas, nor one single formula to define its institutional shape and content. The process largely depends on the context. For sure, however, REC, in whatever

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form it develops, is an important component of any effort to control the environmental impact of global change on mountains.

Relationships between humans and nature have evolved a long history from adaptation to an environment largely dominated by nature’s forces, to a progressive domestication of ecosystems for the benefit of the society. During the XX century, a historically unique combination of demographic, technological, economic, social and political drives has increased exponentially the humankind’s capacity to influence and control the environment. Consequently, the planet’s ecosystem is nowadays largely “dominated” by human presence and activities (Messerli 2006).

Since the 1950s, policy language has referred to this transformation as “development”, a process that for more than four decades was strictly associated with economic growth. In some areas of the world, development has contributed to impressive gains in social well-being. However, it has also magnified the geopolitical and social divides among those who have got access to these gains and those who haven’t got access. Moreover, by the 1970s, fundamental questions started to be raised about the long-term impacts of development on the planet’s ecosystem balance. The UN Conference on Environment and Development (UNCED), held in Rio de Janeiro in 1992, recognized the existence of a two-way linkage between social inequities and environmental threats triggered by development. Agenda 21 – the most important policy statement of the Rio Conference – urged governments and societies to incorporate environmental sustainability and social equity in the development endeavour.

During the last 20 years, these concerns gave birth to a new generation of sustainable development policies aimed at alleviating and if possible avoiding the environmental and social costs of economic growth. Concomitantly, a new awareness that major transformations are occurring in the relationships between humankind and the environment has diffused in society and that the future of our children and grandchildren will largely depend on the choices we are doing in this era of transition.

This is especially true for the 1.2 billion people living in mountain areas (Korner, Oshawa et al 2005), the majority of whom had so far limited opportunities to take advantage of the benefits of development, and, at the same time, has been particularly exposed to its negative environmental impacts. The reasons of this twofold comparative disadvantage of mountain areas are well known. Mountains have complex and fragile ecosystems characterized by verticality, highly differentiated climatic condition and exposed to peculiar environmental threats. Moreo-
ver, remoteness and difficult access have marginalized mountain people (Hofer 2005). Development has often been imposed to them from outside and from above, which has entailed that most environmental risks associated to global change, have been taken on site, while socioeconomic benefits have been reaped outside, in wealthier lowland areas or countries (Hewitt 2006).

Solid scientific evidence exists that the capacity of mountain ecosystems, to provide goods and services, has been significantly threatened (or at best altered) by global change. Mountain research has explored this subject since the early 1990. However, the International Year of Mountains (IYM) 2002 has given impetus to a number of new research initiatives, including, among others, the Global Change in Mountain Region platform (GLOCHAMORE 2005; Huber, Bugmann and Reasoner 2005; Price 2006), and the comprehensive review of the state and trends of mountain ecosystems, undertaken in the framework the Millennium Ecosystem Assessment (Korner, Oshawa et al 2005). A summary of our current understanding of the environmental impact of global change in mountains is presented in the next section of this paper, based on the latter source.

1 Environmental impact of global change in mountains

In the planet’s ecology, mountains act as both water pumps (by extracting moisture from the atmosphere through the orographic uplift of air masses passing over mountain ranges) and water towers (by storing precipitations in glaciers, snow-pack, permafrost, soil and groundwater). Thanks to their orographic profile and vegetation cover, mountain watersheds slow down water discharge from high altitude slopes and regulate water flows in downstream area.

Mountains’ water-tower-function depends largely on the capacity of storing water masses in a solid form (i.e. in mountain glaciers and snow-pack). Due to global warming, a rapid increase in the glacier recession has been observed during the last thirty years. Glacier’s discharge has increased proportionally, enhancing downstream flows. Sometimes this phenomenon hampere mountain watershed capacity to regulate discharge: for instance, in the Himalayas, glacier-lake outburst floods have become increasingly frequent due to boosted upstream flows. However, in many areas of the world, the most common and threatening hydrological impact of glacier regression is the decrease of dry season flows in rivers fed by seasonal melting.

Trends in mountain snowpack-volume and duration reflect microclimate conditions determined by the interplay between altitude, temperature and precipita-
Due to an increase in water temperature of the Eastern Pacific, the snowline in the Andes within 10° of the equator has retreated by 100–150 meters between 1970 and 1986. Snowpack in the lower altitudinal belts of temperate region mountains has also ostensibly decreased as a result of an increase in the altitude at which freezing occur. This trend is well documented in the Alps where decreased snowpack and volume and shorter snow duration is elevating the average altitude at which winter sports can be practiced well above the 1,600 meters quota, that until the 1970s was considered viable in this connection.

Below the snowline, climatic change may either enhance or reduce precipitations, depending on concomitant meteorological phenomena. Decreased rainfall in Eastern African Mountains seems related to reduced generation of moisture through evaporation and transpiration in the surrounding semi-arid lowlands. On the contrary, increased rainfall on sub-tropical and tropical Eastern Andean mountain slopes is associated with seasonal storms caused by the El Niño stream. Worldwide, changes in precipitation regime below the snowline contribute in making more erratic downstream water supply and increasing the risk of rain-season floods and dry-season droughts.

Chemical pollution is another important aspect of global change in mountains. Increased deposition of acids, nutrients, organochlorines and metals on mountain water and soil is documented in many areas of the world. This affects the quality of water and sediments released downstream by mountain watersheds and has a strong on-site impact on mountain biota.

Mountain ecosystems are organized according to a progression of ecological belts, whose extension is determined by altitude, precipitation and sunray exposure. Normally, the vertical progression of these belts includes different types of forest, rangelands and the high-altitude species associations covering seasonally mountaintop rocks and gravel fields: these three biota are referred to as “montane”, “alpine”, and “nival” biota, respectively.

Mountain-biota are very fragile: they are adapted to relatively narrow temperature ranges and precipitation conditions. In addition, they are exposed to physical risks related to sloping terrain and relatively thin soils. As small changes in temperature, water quantity and quality, and soil chemical composition can induce significant changes in the area available for a given biota, impacts of atmospheric factors on species distribution and biodiversity among these three belts is already evident in many mountain areas of the world. However, direct human pressure on mountain lands and resources is certainly much more important in this connection.
According to global land-cover data (Bartholome and Belward 2004), 37% of world’s mountain areas is still covered by forests. Mountain forests account for more than 26% of the global forest stock. With the exception of small protected niches, most mountain forests are semi-natural formations, more or less intervened by human use during the centuries. Human intervention has not always been negative for the ecological health of mountain forest, most of which continue indeed to provide many environmental goods and services. For instance, although, the role of mountain forest in river basin hydrology has been certainly over-estimated in the past, their contribution to decrease soil erosion and control water discharge at the local watershed level remain unquestioned. In addition, mountain forests significantly contribute to ensure water quality in downstream bodies, by filtering upstream discharge and retaining sediments.

However, there are obviously limits to the amount of human pressure and manipulation that mountain forests can sustain. In many areas of the world, extensive clearing of forested slopes, over-grazing and mono-species plantation have impacted negatively on the on-site biodiversity. In addition, over-exploited or poorly-managed mountain-forests tend to be quickly invaded by fast growing tree or shrub species. Generally, this cover is less effective than indigenous species in retaining soil and controlling run-off.

Mountain rangelands (covered by shrub/herbaceous associations) account for an additional 36% of world’s mountain area. They normally extend between the forest-covered belt and “nival” mountain top biota. In most mountain regions of the world, upper rangeland have been managed in a sustainable way by local people. Use has contributed to unique assemblages of plants and wildlife. Examples of sustainable human adaptation to upper rangeland biota can be found in Europe, including the Caucasus, the Himalaya and the Andes.

Like mountain forests, threats to mountain rangelands are more the result of on-site factors than of the climate change, and markedly reflect difference in the socioeconomic situation of industrial and developing countries. Abandonment of high elevation rangelands as grazing areas is common in the former, where dwarf shrubs replace endemic herbaceous species, whose reproduction has become adapted to animal grazing and manuring, and summertime sickling. On the contrary, overexploitation of mountain rangeland, also for agricultural use, is expanding in developing countries, due primarily to human population pressure. The long term consequences will probably be similar to those seen today in the Apennines and other Mediterranean mountains, where over-
exploitation followed by abandonment has led to unprecedented erosion and loss of the endemic flora and fauna.

Human-made agricultural ecosystems are the third most important mountain biota. Land-cover studies estimate that about 4 million square km of mountain land is used for farming, corresponding to 12% of the total mountain area. FAO (Huddleston et al. 2003) has estimated that 78% of this area is only marginally suitable (or not suitable at all) for growing crops. Thus, mountain farming systems are based on a combination of small scale farming, livestock, forestry and other activities, involving the simultaneous or seasonal exploitation of rangeland, forests and marginal agricultural land.

Demographic pressures and emergence of new alternative use of mountain resources are the major drives of change in mountain farming. In industrial countries, out-migration and the development of new income-generating activities (tourism, niche products, etc.) have contributed during the last century to decrease on-site farming pressure on mountain ecosystems. Nevertheless, problems related to land abandonment (such as increased erosion and fire risk) have often become apparent. On the contrary, in developing countries, mountain farming is usually expanding. Extension of the agricultural frontier towards marginal mountain lands is triggered by population growth. FAO estimates that 300 million of persons are currently practicing mountain farming.

Environmental impact of mountain-farming in developing and transitional country include forest-clearing for agriculture and cattle-rising, increased soil-erosion and water body sedimentation, and on-site agrochemical pollution. In some areas of the world, these impacts are magnified by extensive plantations of high value-added mountain products (such as coffee or cocoa), or cultivation (and on-site transformation) of illegal drugs.

Urban settlement and related industries and infrastructures pose additional threats to mountain ecosystems. CIESIN et al. (2004a) estimate that 30% of people settled in mountain areas is urban. Mountain urban population proportion reaches 52% in the humid tropics and 43% in temperate areas. Chemical and biological pollution spreading from metropolitan areas located in valleys or plateaux affects surrounding land, water streams, vegetation and biodiversity. Moreover, it significantly contributes to increase on-site atmospheric pollution with negative impact also on the higher belts of mountain ecosystems.

Hydropower, mining and timbering are all important industries in the mountains. Most of mountain hydropower plants have required inundating large areas
for reservoirs, which has created a risk of induced seismic event or dam failure, potentially resulting in catastrophic events. Logging, which is generally done in pristine forests, is an important cause of degradation of endemic mountain forest biota. When it is carried out on an industrial and massive scale, it also contributes to spoil the hydrological function of mountain forests, with important on-site and down-stream consequences. Mining is often a fundamental source of revenue for many mountain countries. For instance, it accounts for 45% of Chile’s export, 49% of Peru exports and 62% of Papua New Guinea exports (Korner, Oshawa et al 2005). Mines, however, are nearly always destructive to the local environment, because of pollution and toxic waste produced or accidentally released by mine operations, which can also contaminate downstream areas.

Environmental impacts of urban centres and industries in mountain areas are exacerbated by the development of modern communication infrastructures, which contribute to erosion and pollution from traffic, interrupt conservation corridors and reduce the scenic value of mountain landscape. Although, roads are indispensable to reduce remoteness and inaccessibility of highland communities, but inappropriate siting, construction and maintenance often have serious consequences in steep upper watersheds.

To deal with the global change, protection of mountain ecosystems has to be concealed with the legitimate aspiration of mountain people for a wealthier life. Since the issuing of Agenda’s 21, Chapter 13, this is usually referred as sustainable mountain development (SMD).

During the last twenty years, and in particular following the ratification of Agenda 21 by the World Summit on Sustainable Development (Johannesburg, 2002) the International Year on Mountain (2002), significant progress has been made at all levels for creating an enabling policy environment for SMD. At the international level, UN system organizations, such as FAO and UNEP, have supported the operations of global information networks (e.g. the Mountain Partnership) and assisted member states in developing SMD-supportive policies. Under this thrust, governments have paid more attention to the environmental and social situation of their mountain territories, issued new laws aimed at decreasing marginality of mountain areas, and funded (often with the assistance of international donors) an ever increasing number of SMD programmes. This process has also taken advantage from administrative decentralization, which has transferred to mountain local authorities the responsibility of sorting out the balance between socioeconomic and environmental concerns, which would best fit local conditions, needs and priorities.
Nevertheless, matters of geographical scope and scale of intervention are increasingly discussed in SMD circles. Ecological interconnections between territories belonging to the same mountain range ask for a unity of policy and action, which is often difficult to achieve within the political boundaries of the nation state. Typical cross-border environmental issues include air and water pollution, water and watershed management, control of international vehicle traffic on trans-mountain highways, management of fragile high altitude ecosystems (which are very often located in transboundary area), and protection of endangered endemic fauna. Moreover, regional exchange and collaboration (REC) processes are instrumental to the identification of SMD strategies suiting the geo-political, socio-economic and environmental situation of the region.

2 The Alpine Convention: a regional exchange and cooperation platform to address global change in the European Alps

Although, REC processes are on-going in different mountain areas of the world, the Convention for the Protection of the Alps (in short Alpine Convention) is by far the most consolidated experience existing today in this connection. Historically, the Alpine Convention is the outcome of a fifty-year process of consultation and mobilization, led by the “International Commission of the Protection of the Alpine Region” (CIPRA), an international NGO, founded in 1952, by environmentalist groups, mountaineering associations and scientific research institutions from different Alpine countries (Speer 2002).

During the following four decades, CIPRA facilitated a long-term awareness-raising and social mobilisation process, which progressively involved a variety of Alpine stakeholders such as local governments, farmers associations, tourism boards and, at later stage, high-level political champions. Although, the initial focus of this process was on conservation of the alpine environment and landscape, as soon as CIPRA’s constituency broadened, conservation of nature became part of a more comprehensive thrust to promote a development model for the Alpine region compatible with its distinctive environmental, socio-economic and cultural features. In this sense, the Alpine process turned into a region-wide pioneering experience in the field of SMD.

By the end of the 1980s, the multi-stakeholders, trans-national alliance assembled by CIPRA succeeded in incorporating its platform in the official political agendas of Alpine countries. Under this thrust, the Alpine Convention was signed
in 1991 in Salzburg (Austria) by the governments of Austria, France, Germany, Italy, Liechtenstein, Slovenia and Switzerland (Hasslacher 2002).17

The text of the Alpine Convention defines a general framework for protecting Alpine ecosystems and landscapes, promoting sustainable development of mountain communities and supporting regional exchange and cooperation. At the core of the convention, there is a series of twelve obligations that signatory countries committed to respect in their Alpine policies. These include:

1. respecting, preserving and promoting the cultural and social independence of Alpine people and guaranteeing the basis for their living standards;

2. planning, use and cover of Alpine land with the primary goal of preventing land-misuse or abandonment and natural hazards;

3. reducing on-site emission of pollutants and pollutant inputs from outside the region, to a level, which is not harmful to man, animals and plants:

4. adopting soil conservation measures and preventing erosion, based on local farming and forestry methods;

5. enhancing water management by keeping lakes and rivers free of pollution and applying hydraulic engineering techniques and uses of water power, in the interests of both the Alpine people and the environment;

6. protecting, conserving and, whenever necessary, rehabilitating the natural environment and the countryside;

7. preserving or rehabilitating environmentally compatible farming systems, which suit local condition;

8. preserving, reinforcing and restoring forests (in particular for their protection role) by improving the resilience of forest ecosystems, promoting local forestry techniques and preventing detrimental uses by outsiders;

9. restricting recreational activities that are harmful to the environment and harmonizing tourism with ecological and social requirements;

10. reducing the volume of inter-Alpine and trans-Alpine traffic to a level, which is not harmful to humans, animals and plants and their habitats, in

17 The convention was subsequently endorsed also by Monaco. The current geographical scope of the convention corresponds to a 191,000 km² trans-national territory, administered by 6000 alpine municipalities, and hosting a total population of about 13 millions.
particular by switching more traffic to the railways through incentives that comply with market principles, without discriminations on the ground of nationality;

11. introducing methods for the production, distribution and use of energy, which preserve the countryside and are environmentally compatible, and promoting energy-saving measures;

12. developing waste collection, utilization and disposal systems, which meet the specific topographic, geological and climatic requirements of the Alpine region, paying particular attention to waste avoidance (Alpine Convention 1991).

Turning this initial declaration of intents in truly binding political commitments proved to be difficult and time demanding. It took about ten years for achieving the ratification and enforcement of the text of the convention by signatory countries. Four out of the twelve protocols that would make operational conventions’ obligations are still under discussion, while ratification by some country is still in pending for the other eight. To facilitate the completion of the diplomatic agreement and start implementing the protocols that are already in force, a Permanent Secretariat for the Alpine Conference (the operational body of the convention) was established in 2003 and a multi-annual implementation plan was launched (Alpine Conference 2005).

18 These include protection of population and culture, air quality, water management and waste products
19 These include nature and landscape protection, mountain agriculture, land planning and sustainable development, mountain forests, tourism, energy, soil protection, and transport.
20 The Alpin Conference Multi-annual Plan is supposed to be a subsidiary initiative complementing the initiatives that, when applicable, the Alpine Convention signatory government will undertake to implement the obligations foreseen by the ratified protocols. In addition, the plan will build on the experience of the networks that have been established during the 1990s to address specific thematic issues related to the sustainable development of the Alps. This includes the Alpine Network of Protected Areas, the “Alliance in the Alps” network of local authorities, and the International Scientific Committee for Alpine Research (ISCAR). Eventually NGOs will continue to play an important role. In particular, CIPRA’s programmes on communication (Alpmedia) and dissemination of knowledge and networking for sustainable development (“Future in the Alps”) are expected to provide technical and organizational support to the implementation of the multi-annual plan (Alpine Conference 2005).
Notwithstanding the above limitations and delays, a fifty-year long process has allowed the Alpine Convention to build a comprehensive and binding policy framework for promoting SMD in the Alps. However, this achievement should be interpreted in the light of three very peculiar enabling factors.

- First, it must be recognized that (unlike most other mountain countries in the world) signatories of the Alpine Convention are affluent, highly industrialized nations. They can afford the costs of SMD in the Alps, either with their own fiscal resources or through the additional resources made available by the European Union (EU).

- Second, since the end of World War 2, the Alpine area has enjoyed peaceful and cooperative international relationships. Alpine countries' international policies have been inspired during the last 50 years by the spirit of partnership, which has led to the establishment of the EU. In fact, the building of the Alpine Convention has historically paralleled the making of the EU, which, on the other hand, has signed the convention recognizing it as a European sub-regional agreement.

- Third, making of the Alpine Convention has been supported by the spontaneous diffusion in Alpine societies of a new “post-industrial” and “green” vision of the relationships between humankind and nature, which has fostered the demand for environmental services and created the political consensus needed to invest in SMD. In this prospective, the Alpine Convention should be understood as the final political expression of a socio-economic and cultural change process, which started to be enacted from the grassroots long before the signing, ratification and implementation of the formal international agreement.

The above considerations suggest that the strength of the Alpine Convention as a regional policy tool to address global change in the Alps is rooted in a unique combination of economic and financial capacity, political willingness and socio-cultural consensus. This has made possible to transfer the responsibility for the convention’s obligation to the signatory states and assign to the Alpine Conference and other regional operational bodies a “subsidiary” role. We should then ask ourselves to what extent the Alpine experience can be taken as a model that could be replicated (with the always-necessary adjustments and adaptations) in other mountain regions of the world.

This issue was the core subject discussed in the Conference on “The Alpine Process – An Approach for other Mountain Regions?” carried out in Berchtesgaden (Germany) during the International Year of the Mountain (2002). In that oppor-
tunity, based on the analysis of the Alpine Convention experience, ten general principles for building REC in mountain areas were identified, as follows:

1. holding governments accountable;
2. keeping a regional focus;
3. fostering equity and equality among countries;
4. involving decentralised administrative and governance institutions;
5. setting clear short/medium term objectives and chart a flexible course for their achievement;
6. promoting participation of local communities and civil society organizations;
7. establishing thematic networks;
8. building capacity and share knowledge;
9. encouraging partnership and
10. engaging the international community.

Beyond these general principles, however, the conference made clear that the conditions in mountain areas vary widely and that the Alpine process and Convention cannot be simplistically transferred. Rather, regional needs, circumstances and state of development should guide the identification of suitable points of departure for REC. This entails that stipulation of a full-fledged Convention might not be viable, nor needed in some areas; case-by-case, there may be other policy instruments (strategies, programs or charters), below the level of Convention proper, which can serve as useful stepping-stones (CIPRA 2002).

Berchtesgaden recommendations are guiding the work done by FAO, in collaboration with UNEP and the Mountain Partnership Secretariat, to trigger REC processes in the Carpathians, the Caucasus, the Balkans, the Central Asian Mountains, and the Andes (UNEP 2007). Nevertheless, it must be acknowledged that all these experiences continue to be largely inspired by the Alpine model. All of them are based on a mix of awareness-raising activities at the grassroots and high-level negotiation, which is expected to lead towards formulation of a politically binding instrument. All of them expect signatory governments and local civil societies to be fully accountable of the obligations subscribed.

3 Building regional capacity to address global change in an African mountain area: the FAO/GEF Fouta-Djallon Highlands programme

A different, approach might be needed in those areas of the world, where extreme poverty, a major environmental crisis, and weaknesses of the public sector require that REC promoters directly engage in the provision of services that Governments
are not able to deliver. This is certainly the case of the Fouta Djallon Highlands of Western Africa. In this area, FAO\textsuperscript{21} is currently launching a regional programme, which includes: (i) a normative initiative aimed at addressing national governments’ capacity to manage the environmental crisis affecting the Fouta Djallon Highlands and fostering REC; and (ii) the full implementation of a network of 29 field-projects aimed at supporting mountain peoples in strengthening their livelihoods and improving natural resource management practices (GEF-FAO 2005). A closer look to this programme will allow in making sense of how the concept of regional exchange and cooperation for addressing global change can be adapted to fit the environmental, geo-political and socio-economic setting of this African mountain area.

The Fouta Djallon Highlands are composed of a group of high plateaux (whose altitude varies from 500 to 1500 m), concentrated in the central part of the Republic of Guinea. These plateaux extend beyond Guinea into four neighbouring countries (Guinea-Bissau, Mali, Senegal and Sierra Leone) through associated foothills and the upper basin of the rivers originated in the Fouta Djallon Highlands. The total area of this region is about 325,000 km\textsuperscript{2}.

The Fouta Djallon Highlands are the source area of a large and diverse natural water network that extends into ten West African countries. More than 8,000 springs support a dense system of 15 rivers, including six international rivers (Niger, Senegal, Gambia, Kaba, Kolenté and Koliba). More than 70 percent of the water from these rivers originates from the Fouta Djallon “water tower”. Similarly, the Fouta Djallon Highlands are a major source of groundwater recharge, a resource that in the sub-region plays a critical role for fulfilling domestic and agricultural needs of non-riverine populations.

Due to their geographic and climatic diversity, the Highlands support a rich diversity of ecosystems. In terms of vegetative cover, the mountain forests occupy the central plateau of the Highlands, while the woodland and bush are more prevalent in the foot-lands. This broad range of ecosystems in the Fouta Djallon Highlands allows for a rich biological diversity.

The Highlands also sustain the livelihoods of a large population, not only in Guinea but also in all the areas through, which the aforementioned rivers flow.

\textsuperscript{21} The Fouta Djallon Highlands Integrate Natural Resource Management project is implemented by FAO with Global Environmental Facility (GEF) funding and in collaboration with the Governments of Gambia, Guinea, Guinea-Bissau, Mali, Mauritania, Niger, Senegal and Sierra Leone)
The estimated population of the broad Fouta Djallon Highlands is about 15 million, 3 millions of which are settled in the plateaus. All over the region, the population is largely rural (between 60 to 75 percent) with a population density varying between 40 to 120 persons/km². The higher population density is found in the central plateau.

Fouta Djallon Highlands’ rural population is highly dependent on natural resources, which are used for agriculture, livestock breeding, fishing, and craft-industries. Furthermore, the Fouta Djallon Highlands forests represent a major source of energy, construction and raw-materials for furniture production, as well as aromatic oils that are also traded. Sustainable management of Fouta Djallon Highlands’s natural resources is hence essential to local livelihoods.

Global change affects the Fouta Djallon Highlands region in different ways. Climate is tropical and current annual precipitation ranges between 1,500 and 1,800 mm. However, records dating back to 1931 indicate that, since the early 1970s, average rainfall has been progressively decreasing. This trend, which seriously threatens Fouta Djallon Highlands’ hydrology and ecosystems, is largely related to extensive deforestation. It is estimated that 140,000 ha of forest are lost annually in the Fouta Djallon Highlands region. Main drivers of deforestation include clearing-for-farming and non-sustainable forestry practices carried out by an ever-increasing population, migrating in search for water from the downstream Sahel region.

Research evidence suggests that mounting pressure on hillside agricultural land and deforestation are leading to soil erosion, declining soil fertility, accelerated water discharge and runoff, increased siltation and sedimentation of water-courses, drying up of springs, and invasion of aquatic weeds in the watercourses. In addition, there appears to be an overall decline in the habitat and wild flora and fauna diversity.

International recognition of the need for a regional collaborative approach to the integrated management of the Fouta Djallon Highlands originates from the International Soils Conference held in Dalaba, Guinea, in 1959. However, it was not until the beginning of the 1970s, that a concerted action was agreed upon under the aegis of the Organization of African Unity (OAU). In 1981, the African Union (formerly the OAU) established, with the assistance of UNEP, FAO, UNESCO and UNSO, the Fouta Djallon Highlands Management Programme, which involved the eight countries (Gambia, Guinea, Guinea-Bissau, Mali, Mauritania, Niger, Senegal and Sierra Leone) that depend on waters from the Highlands.
The Fouta Djallon Highlands Management Programme was implemented from 1981 to 1998. Efforts were primarily directed at experimenting with sustainable production techniques (agriculture, silviculture, and pastoral) and of monitoring impacts of the production techniques on the environment, generally; and the transborder resources, specifically. In 1999, the third Ministerial Conference of the Fouta Djallon Highlands Management Programme called for “the development of a common approach and vision in addressing the problems of the Fouta Djallon Highlands”. This Conference also decided to confer international status on the Fouta Djallon Highlands through agreeing to a common framework among Member States to facilitate co-operation in achieving the sustainable management and conservation of the massif.

To support the re-launching of the Fouta Djallon Highlands Management Programme, a Trans-border Diagnostic Analysis was carried out with GEF funding. This study showed that projects conducted, so far, did not significantly contribute to arresting the environmental degradation of the area. Moreover, it highlighted that investments made by the Fouta Djallon Highlands Management Programme were generally poorly integrated into national policies and legislations and that a strategy of giving stakeholders and local communities a sense of responsibility was missing.

The countries’ view of the Fouta Djallon Highlands as a priority in the sub-region was underlined in the fourth Ministerial Conference held in Banjul in March 2004. The Conference also approved the main priority issues to be addressed. These were:

- integrated watershed management and land restoration;
- participatory management of natural resources (forests, fauna and pastures);
- biodiversity conservation and sustainable utilization;
- institutional capacity-building and strengthening of stakeholders’ technical knowledge and skills; and
- coordination of stakeholders’ interventions.

In addition, the Ministerial Conference also accepted the proposal for the creation of a Regional Observatory of the Fouta Djallon Highlands.

Based on findings of the diagnostic studies and Ministerial conference agreement, the current Fouta Djallon Highlands Integrated Natural Resources Management Project was designed in 2005. The environmental objective of this ten-year GEF project is to mitigate the causes and negative impacts of land degra-
dation on the structural and functional integrity of the ecosystems of the Fouta Djallon Highlands through establishment of a regional legal and institutional framework, strengthen institutional capacity, and development of replicable, community-based sustainable land-management models.

The Project has a total budget of 44 millions of dollars and a total duration of ten years. It includes three main components (plus a management component) as follows:

– **Enhanced regional collaboration.** – This component will support the establishment of a comprehensive and consensual legal and institutional framework that will facilitate and strengthen cooperation between the states in the management of the shared and trans-border natural resources of the FDH. It will also include activities aimed at harmonizing relevant legislation of the eight participating countries, and the establishment of an Observatory for the Fouta Djallon Highlands, which will have the technical responsibility of overseeing the inventory and monitoring of the status of natural resources in selected pilot sites and transborder areas of the Fouta Djallon Highlands.

– **Improved natural resource management in the pilot-sites and in the watershed**
  – This component will support interventions in 29 pilot sites, the six upper main trans-border rivers and a number of trans-border protected areas. The interventions will be implemented based on the design and adoption of community-based natural resources management plans. In addition, new income-generating opportunities will be identified and promoted to improve the livelihoods of the population in the Fouta Djallon Highlands.

– **Mobilization and training of stakeholders in integrated natural resource management** – Under this component, training and extension activities will be carried out to strengthen local institutions, community-based organizations and other stakeholders’ capacity to address natural resources management and institutional development.

The project is expected to have a twofold impact on the human determinants of global change in the Fouta Djallon Highlands.

– At the community level, improved natural resource and ecosystem function will generate local benefits and contribute to poverty alleviation, which in turn will contribute to a more sustainable use of natural resources. The Project will train and empower participating communities in restoring ecosystem functioning, curbing land-degradation, managing a sustainable
manner of water resources and diversifying their sources of income. Relevant activities are expected to generate direct benefits to local stakeholders and provide the necessary incentives for them to adopt improved natural resource management techniques on a continued basis.

– At the regional level, the project will strengthen already existing commitments to the conservation and sustainable management of the FDH taken by the participating countries and facilitate the finalization and adoption of the international institutional and legal framework in support of a regional approach to managing the area. REC will be further enhanced through the harmonization of respective country’s natural resource management policies and legislation. Capacity to monitor ecosystems’ change in the area by national governments will also be improved through the establishment of a joint Observatory. The project will also lead to the institutionalization of regular contributions from governments and local communities (in kind and cash) for transborder watershed management in the FDH area, which will ensure continued funding and sustainability of regional activities.

4 Conclusions

In this paper, after reviewing the impact of global change in the mountains, we have focused on the role that REC can play in addressing sustainable mountain development. Two opposite geo-political cases have been presented in this connection: the European Alpine region and the Fouta Djallon Highlands (FDH) of Western Africa.

The Alpine region case illustrates how a fifty year long REC process, rooted in the “post-industrial” socioeconomic and cultural transformation of European society and supported by high-level political lobbying activities, has resulted in comprehensive political platform, which binds the government to respect the SMD principles in their policies and governance by-laws. In this framework, REC institutions have been created, but they play a subsidiary role: structural intervention and SMD programmes are supported by existing national and European financing mechanisms. Responsibilities of the operational bodies of the Alpine Convention are limited to networking, monitoring and facilitation.

The Fouta Djallon case shows how an REC process for SMD is being developed in a context in which national governments have limited capacity to address the vicious cycle linking extreme poverty with environmental degradation. In this setting, a Global Environmental Facility (GEF) project has adopted a two-pronged
programme format, with one programme component focusing on capacity building and awareness raising for REC, and other components addressing livelihoods, natural resource management and social mobilization issues at the grassroots level. This is made possible by a substantial financial endowment, which would allow the programme to operate as an independent and non-subsidiary entity. Programme core expected outcome is fostering REC for natural resource management policies, based on lessons learned in the field about approaches, methods and techniques that can break the aforementioned linkages between extreme poverty and environmental degradation.

Several intermediate alternatives exist between the open-ended and subsidiary process illustrated by the Alpine Convention case and the structured and medium term programme depicted by the Fouta Djallon Highlands case. In areas where the state has limited capacity to support and implement SMD programmes and services, the stipulation of an official regional convention can be instrumental to attract funding by international donors. In other cases, an international NGO may play a pivotal role by combining long-term capacity-building and awareness-raising actions with a portfolio of field projects providing short-term answer to local SMD problems. This looks very much the case of ICIMOD in the Himalayan region, which is discussed in other conference papers. In brief, there is no single way to promote regional cooperation in mountain areas, nor one single formula to define its institutional shape and content. The process largely depends on the context. For sure, however, REC, in whatever form it develops, is an important component of any effort to control the environmental impact of global change on mountains.

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2.3 Globalisation in Mountain Context: Risks and Opportunities*

N.S. Jodha

1 Introduction

Put in simple terms economic globalization implies adoption and promotion of market friendly and market driven economic and trade policies and practices directed to closer integration of economic activities at global to regional levels. It differs from the conventional commercialization processes, in terms of speed, inter-connections of activities, incentives and pressures affecting the trading partners at different levels as well as the institutional mechanisms such as WTO to enforce the norms and rules of integration and interactions, in keeping with the primacy to market and reduced role of state and community, in regulating, coordinating and linking different economic transactions. The said processes carry both risks and opportunities for the participants, though the participants less prepared for this, such as the mountain regions and communities, face greater risks at least in the short run. This paper addresses the above issues through highlighting the involved conceptual issues supplemented by relevant stakeholders’ views and responses to globalization led changes, taking place at different levels in the selected areas of HK-H countries, covered by a brief exploratory study by ICIMOD (Jodha 2002a).

To explore and understand prospects and challenges of globalization led or influenced integration and exchange patterns involving mountain areas, it will be helpful to allude to some basics underlying the processes of exchange systems involving resources, products, services etc. To begin with the exchange (on varying terms of trade) between two or more trading partners takes place because they are differently endowed in terms of their natural and manmade resources and facilities, which give rise to differences in opportunities and constraints associated with the exchanged components. These differences determine the level of comparative advantages inducing exchange (including barter system) involving different trading partners.

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In the mountain context the said opportunities and constraint as well as the economic integration patterns and exchange processes are created or crucially affected by the key mountain conditions termed as mountain specificities, which broadly differentiate mountains from plains. They include: inaccessibility or limited accessibility, high degree of fragility, marginality, diversity, niche-opportunities and human adaptations to the above conditions. It may be added that a number of the above mountain specificities have both natural as well as social dimensions, and they also exhibit intra-mountain differences. For instance, all mountain areas are neither equally fragile nor equally inaccessible. However, these variables crucially influence the pace and patterns of integration and exchange systems involving mountain areas.

To understand the role and impact of mountain specificities on exchange opportunities and their underlying economic and related integration patterns, we briefly digress into the indicative factors or circumstances which contribute towards the very initiation and conduct of exchange processes.

2 The Exchange Process: The Basics and the Mountain Context

(a) Products, production and support facilities: Though the very difference in terms of type of potentially tradable products, services and the resources, is the first prerequisite for exchange to take place, their productivity, and surplus generation for exchange are equally important.

As a second set of circumstances to help exchange relates to both natural and human capacities to facilitate fulfilment of the above conditions. This may include availability, access to, and scope for application of relevant technologies and inputs to enhance productivity and surplus of tradable items.

(b) Post-production activities and facilities: Beyond the above largely primary sector related conditions, there are other indicative requirements to make exchange as an effective process. They relate to internal and external market links including: physical mobility, availability and access to information, capacity and entrepreneurship to mobilize needed investments, effective management of risks and promotion of value adding activities for harnessing own comparative advantages through exchange. Finally, it involves institutional and technical arrangements conducive to all the above requirements.
One can look at the broad mountain situation in the context of above mentioned indicative circumstances or pre-requisites for an effective and beneficial exchange process. This could be done by juxtaposing the above mentioned pre-requisites for effective exchange processes and the imperatives of mountain specificities.

Assessed through the lens of basic prequisites of trade and exchange, mountain areas are endowed with rich potential due to specific niche (resources, products and services) and vast extent of diversities characterizing their resource base and production possibilities. Timber, a range of NTFPs, minerals, water and hydro-power, variety of agricultural and horticultural products and seasonally differentiated environmental services are well recognized items, which potentially impart comparative advantage to mountain areas in the context of national and international trade. However, a closer look would suggest that the above mentioned are manifestation of ecological or nature-endowed niche of mountain areas, which in reality are not adequately complemented by socio-economic components of niche, to facilitate effective harnessing of ecological niche. In other words, while mountain niche and diversities offer vast potential for exchange-led development, its realization is impeded by other mountain specificities such as fragility, inaccessibility, marginality (and their missing management). Efforts to promote exchange systems without addressing these constraints, generally prove exploitative and have serious backlash effects on mountain areas, which in turn, as the supplier of traded items, acquire the status of hinterlands rather than integral parts of the economic system (Jodha 2001). Tables 1 and 2 briefly summarise the situation.
Table 1: Mountain Specificities and their Indicative Exchange Affecting Imperatives

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<td>c) Imperatives (appropriate responses, adaptation approaches to reduce impacts of (b))</td>
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<tr>
<td>a) Product of</td>
<td></td>
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<tr>
<td>b) Manifestations and implications (i.e., impeding effective economic integration and exchange processes)</td>
<td></td>
</tr>
<tr>
<td>c) Imperatives (appropriate responses, adaptation approaches to reduce impacts of (b))</td>
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### Limited Accessibility

- **Product of**
  - Slope, altitude, terrain, seasonal hazards, and so on (and lack of prior investment to overcome them)

- **Manifestations and implications**
  - Isolation, semi-closedness, poor mobility, high cost of: mobility, infrastructural logistics, support systems, and production/exchange activities
  - Limited access to, and dependability of, external support (products, inputs, resources, experiences)
  - Detrimental to harnessing niche and gains from trade, invisibility of problems/potentials to outsiders

- **Imperatives**
  - Local resource centred, diversified production/consumption activities fitting to spatial and temporal opportunities and constraints
  - Local regeneration of resources, protection, regulated use; recycling etc.
  - Focus on low-weight/volume and high-value products for trade
  - Nature and scale of operations as permitted by the degree of accessibility/mobility and local availability of resources
  - Development interventions with a focus on:
    - Decentralization and local participation: reduction of inaccessibility with sensitivity to other mountain conditions (e.g., fragility) and changed development norms and investment yardsticks

### Fragility and Marginality

- **Product of**
  - Combined operations of slope/altitude, and geologic, edaphic, and biotic factors; biophysical constraints create socio-economic marginality

- **Manifestations and implications (i.e. promote vulnerability and poverty and impeding effective exchange process, market integration on equal terms)**
  - Resources vulnerable to rapid degradation, unsuited to intensification, use of costly inputs; low carrying capacity
  - Limited, low productivity, high risk production options; little surplus generation or reinvestment and subsistence orientation preventing high cost-high productivity options, disregard by 'mainstream' societies
  - High overhead cost of resource use, infrastructural development; leading to permanent under-investment or selective investment for exploiting niche for mainstream economy
  - People’s low resource capacity preventing use of costly options for resource upgrading and production
  - Socio-political-marginality of communities and their disregard by 'mainstream' societies
| c) Imperatives  
(i.e., appropriate responses, adaptation approaches to reduce constraining impacts of (b)) | – Upgrading resources (e.g., by terracing) and regulation of usage  
– Focus on low intensity, high stability in resource use  
– Diversification involving a mix of high and low intensity uses of land, a mix of production and conservation measures with low cost  
– Local regeneration of resources, recycling, regulated use, dependence on nature’s regenerative processes and collective regulatory measures/institutions  
– Different norms for investment to take care of high overhead costs  
– Special focus on more vulnerable areas and people and their demarginalisation/empowerment |
<table>
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<tbody>
<tr>
<td>Diversity &amp; Niche</td>
<td>Diversity &amp; Niche</td>
</tr>
<tr>
<td>a) Product of high potential, heterogeneous resources</td>
<td>– Interactions between different factors ranging from elevation and altitude to soils and climatic conditions, as well as biological and human adaptations to them, uniqueness of environmental resources and human responses</td>
</tr>
</tbody>
</table>
| b) Manifestations and implications (i.e. potential for exchange systems with high comparative advantage, reducing poverty etc.) | – A basis for spatially and temporally diversified and interlinked activities conducive to sustainability, strong location specificity of production and consumption activities limiting the scope for large-scale operation; focus on demand rationing, supply not on expansion  
– Potential for products, services, activities with comparative advantages |
| c) Imperatives (i.e., appropriate responses, adaptation approaches to harness potential through exchange process, and promote poverty-reducing activities) | – Small-scale, interlinked, diversified production/consumption activities differentiated temporally and spatially for fuller use of environment  
– Need diversified and decentralized interventions to match diversity  
– Equitable external market links; infrastructural development and local capacity building to guide the mountain development interventions and harness the opportunities |

Source: Table adapted from Jodha (1997) and based on evidence and inferences from over 60 studies referred to by Jodha and Shrestha (1994)
Table 2: The Indicative Factors/Conditions Potentially Ensuring Gainful Exchange Option and their Status in Mountain Areas

| (A) Mountain features constraining or favouring conditions required for gains from effective exchange systems | (B) Indicative conditions/processes promoted by and conducive to gains from exchange |
|---|---|---|---|---|---|---|
| | Relating to production processes | Relating to post production processes |
| High productivity involving resource use intensification, high input availability and absorption capacity | Specialisation and economies of scale | Trad-able surplus generation | Infrastructure facilities, access to markets | Equitable effective external links | Human capacities quick response to changes |
| Limited Accessibility: distance, semi-closedness, high cost of mobility and operational logistics, low dependability of external support, or supplies | (−) | (−) | (−) | (−) | (−) | (−) |
| Fragility: vulnerability to degradation with intensity of use, limited low productivity/ pay-offs options | (−)a | (−) | (−) | (−) | (−) | (−) |
| Marginality: limited, low pay-off options; resource scarcities and uncertainties, cut off from the ‘mainstream’, social vulnerability | (−) | (−) | (−) | (−) | (−) | (−) |

*a* denotes the condition being less likely to occur.
<table>
<thead>
<tr>
<th>Diversity: high location specificity, potential for temporally and spatially inter-linked diversified products/activities</th>
<th>(+) a</th>
<th>(−)</th>
<th>(+)</th>
<th>(−)</th>
<th>(−)</th>
<th>(−)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Niche: potential for numerous, unique products/activities requiring capacities to harness them</td>
<td>(+)</td>
<td>(+)</td>
<td>(+)</td>
<td>(−)</td>
<td>(−)</td>
<td>(−)</td>
</tr>
<tr>
<td>Human adaptation mechanisms: traditional resource management practices-folk agronomy, diversification, recycling, demand rationing, etc.</td>
<td>(−)</td>
<td>(−)</td>
<td>(−)</td>
<td>(−)</td>
<td>(−)</td>
<td>(−)</td>
</tr>
</tbody>
</table>

Source: Table adapted from Jodha (1997)

Note: a (-) and (+) respectively indicate “extremely limited” and “relatively higher” degrees of convergence between imperatives of mountain features and the conditions associated with potential gains from exchange systems. The situation may differ between more accessible (commercialised) and poorly accessible areas. Besides, the socio-economic vulnerabilities may further affect the above degrees of convergence. To enhance the exchange opportunities as adaptations options against trade impediments, the degree of convergence between (A) and (B) indicated by (+) has to be increased. This would involve (i) enhanced accessibility, (ii) upgrading and development of fragile/marginal lands or evolve high pay off activities suited to them; (iii) demarginalisation and empowerment of mountain communities; (iv) harnessing of niche and high pay off diversified activities with equitable local gains and (v) build upon indigenous knowledge combined with R&D based scientific measures to evolve resource management/usage systems with high returns. All this needs greater understanding of mountain situation, and act accordingly.
3 Exchange-Obstructing Role of Mountain Specificities

Due to fragility and marginality the resource use intensity that facilitates enhanced productivity and surplus generation for exchange is obstructed. The consequent low productivity, higher poverty, low buying capacity and socio-economic marginality manifested in many ways, further restrict the capacity for high investment needed for harnessing high pay off niche and diversity. Fragility further restricts the scope for reducing inaccessibility (through infrastructural building) which is essential for mobility, market links and effective exchange.

Inaccessibility on its own restricts exchange processes by imposing isolation, impeding mobility and causing high cost of secondary sector activities. Inaccessibility makes harnessing of mountain opportunities costly and uncompetitive, and unattractive for the external agencies. Its final consequence is limited, unequal and exploitative external links, causing absence of a crucial prerequisite for effective exchange process.

To sum up diversity of resources, products and services and specific niche are potentially the most important features of mountains to strengthen their exchange and economic links with others. But fragility, inaccessibility and marginality, individually or jointly impede the whole process of equitable market integration and fair system of exchange. Consequently, the opportunities are harnessed on small scale with limited exchange systems, particularly in the relatively more accessible areas. Intra-mountain disparities (e.g. between more accessible and poorly accessible areas) is one consequence of this. Furthermore, wherever such harnessing involving non-mountain external agencies is possible, the pattern is characterized by over-extraction of niche and unequal highland – lowland economic links (Jodha 2001).

4 Human Adaptations: Evolution of Exchange Systems

However, despite all the constraints and limitations, exchange systems involving mountain resources and products have gradually evolved in mountain regions. Ranging from barter systems to trade involving money has characterized several mountain regions. As in several other regions (Platteu 1991), in mountain areas this has been a result of human adaptation mechanisms to manage constraints and opportunities created by natural circumstances in mountain areas. Human adaptations to mountain conditions are by themselves quite unique in terms of helping mountain communities to survive and grow under high risk, low productivity environments. Self provisioning systems involving limited, small scale
exchange, in keeping with the limitations imposed by mountain specificities, reflect the general situation in most of the mountain areas. Besides, several trading hubs in better accessible areas, have developed, where more modern exchange system/links can be seen. This manifests the dynamic aspect of human adaptations, where gradual change involving the increasing role of exchange systems have characterised mountain areas and communities.

The human adaptations seen as steps in evolving socio-economic and related complements to the ecological niche of mountain areas, could be put under broadly two phases of promotion of exchange links and associated processes. Based on their primary driving circumstances; approaches to manage or by pass the imperatives of mountain specificities and the resultant outcomes, they could be described as:

(i) Traditional, primarily nature-driven production and exchange systems, conditioned by relative isolation and semi-closed high risk situation of mountain areas, dominated by self provisioning systems supplemented by barter and petty trading.

(ii) A phase of exchange process induced by administrative (political) and economic (market) integration of mountain areas with mainstream plain economies, where market and state complemented each other in promoting exchange processes involving enhanced trade links and level of monetization of activities (Nathan and Jodha 2002).

The focus, broad features and consequences of (i) and (ii) are presented in the following, quite self explanatory Table 3.
Table 3: Indicative Picture of Adaptations to Mountain Conditions seen through the Lens of Exchange-Processes in Mountain Areas during Different Phases

<table>
<thead>
<tr>
<th>Situation under Traditional Primarily Nature-Driven Phase</th>
<th>Situation under Economic and Administration Integration Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Basic objective circumstances</strong></td>
<td></td>
</tr>
<tr>
<td>(i) Limited accessibility, isolation and semi-closedness; poor mobility and external link; greater dependence on local resource, largely subsistence oriented production systems.</td>
<td>(i) Increased physical, administrative and market integration of traditionally isolated areas with mainstream systems, reducing exclusive dependence on local resources; mix of market and subsistence orientation.</td>
</tr>
<tr>
<td>(ii) Autonomy, local control of local resources with little external impositions low population and limited local and external demand pressure.</td>
<td>(ii) External linkage-based diversification of sources of sustenance; local autonomy and traditional practices marginalized due to administrative, fiscal impositions</td>
</tr>
<tr>
<td><strong>B. Key driving circumstances generated by (A)</strong></td>
<td></td>
</tr>
<tr>
<td>Locally evolved defences against bio-physical and socio-economic vulnerabilities; collective stake in protection/regeneration of local resource, through two way adaptation to mountain specificities with focus on demand rationing.</td>
<td>Integration linkage and unequal exchange relations, enhanced role of externally designed, imposed interventions, insensitivity to fragility, marginality; external demand-focused resource extraction; priority to supply enhancement over demand management, increased resource flows from mountains, unequal highland – lowland economic links.</td>
</tr>
<tr>
<td><strong>C. Consequences</strong></td>
<td></td>
</tr>
<tr>
<td>Diversified, conservation focused resource use; priority to demand rationing in place of supply enhancement through over extraction, petty trade, periodic migration; money involving exchange in better accessible areas and “market towns” in mountain areas.</td>
<td>Emergence of duel sector (traditional and market driven) systems; marginalization of traditional systems; mountain serving the mainstream economy with high social and environmental costs, prominence of market and public interventions without mountain perspective, emerging indicators of unsustainability.</td>
</tr>
</tbody>
</table>

Source compilation based on inferences and evidence from various studies in HK-H region synthesized by Jodha (1996, 1998)
It is not proposed to elaborate on them except indicating their approach towards mountain specificities and how they were managed (Jodha 1996, 1998). The traditional system emphasized a “two way adaptation to mountain specificities” i.e. adapting resource use and demand pressure to the limitation of resource base and amending (as far as possible) the resources (e.g. terracing on fragile slopes), to meet the increasing human needs. The role of formal exchange systems was rather limited (except in better accessible areas).

The situation under “integration led phase” has been quite different. “Integration” on equal and fair terms does help in enhanced well being and progress of the involved parties, but in the case of mountains the initial gaps (caused by marginality, inaccessibility, fragility etc.) promoted unequal links between mountain communities and external agencies, as reflected through patterns of unequal highland lowland economic links (Jodha 2001). Consequently, despite several gains of integration, due to the increased role of external agencies and marginalization of traditional approaches and practices, the whole focus of mountain resource use systems got shifted to supply enhancement rather than (internal and external) demand management. Consequently, the niche resources in particular, faced over extraction and depletion. The mountain communities had to face increased external economic dependency (Bjønness 1983). These “integration-linked” elements can also help in understanding the repercussion of globalization process for mountain areas and communities. This is so because the exchange systems and associated integration processes promoted under economic globalization in a way represent up-scaling and deepening of “integration” and are likely to further strengthen the market focused and market driven patterns that emerged with the gradual integration of mountain areas with mainstream economic systems. In fact the pace and patterns of integration or its formal/informal terms and conditions, would largely determine the risks and opportunities globalization process might create for the mountain areas and communities.

5 The Globalisation and Mountain Context

During the earlier discussion, Table 2 sketched the broad circumstances of mountain areas that any exchange and trade focused intervention including globalization process has to negotiate. Its effectiveness as an equitable system will be largely conditioned by the exchange impeding mountain specificities such as inaccessibility, marginality, fragility. Ignoring them would mean more risks and negative repercussion for the mountain areas and communities. Their appropri-
ate management on the other hand could generate several gainful opportunities for the mountains.

To make the discussion operationally relevant, it will be helpful to contextualize the potential consequences of globalization with reference to some operational issues observed in the changing situation in mountain areas. Some of the important contexts in this regard may include:

(i) Visible incompatibilities between the driving forces and operational mechanisms of globalization and the imperatives of mountain specificities;

(ii) Complementarities between integration-led prevailing patterns of selective resource (niche) extraction and the ones promoted by globalization, particularly through top-down external impositions with little sensitivity to mountain specificities;

(iii) Links between forces and processes promoting economic globalization and global environmental change (e.g. profitability and uncontrolled demand-driven over-extraction of mountain resources and emerging un-sustainability indicators);

(iv) Impact on prevailing (community-led) resource management and livelihood options, following their marginalization and disregard due to changed (pro-maker policies);

(v) Scattered, small scale initiatives (through NGO etc.) helping community participation in globalization led initiatives e.g. new enterprises and market led partnerships;

(vi) Emerging cases of relaxation of mountain constraints (e.g. inaccessibility, marginality etc.) using financial and technical support from agencies promoting globalization;

(vii) Possibilities of “localized formulations of globalization process”; “identification of links between global flows and local spaces” etc.;

(viii) Policy-programmes to facilitate gainful/equitable integration of mountain economies in to wider economic systems.

The choice of the above and other related contexts was the basis of a short-term exploratory study on Globalisation and Fragile Mountains conducted by ICI-MOD with McArthur Foundation support during 2001-2002. The purpose was to assess the people’s awareness and responses to various elements of globalisa-
tion percolating to micro – macro levels through various changes in state policies and programmes including economic liberalization and reduced welfare programmes as dictated by market forces, affecting the activities and practices at lower levels in the selected areas of HK-H countries (Jodha 2002a). The study involved field visits, group discussion as well as interactions with the specialized agencies including concerned government departments, private sector agencies and academics and practitioners concerned with globalization issues at field levels. The important understanding generated by the exploratory study is summarized under Table 4, and briefly discussed below. The evidence and insights underlying the following discussion were synthesized from the documents and presentations from different HK-H countries listed under Annexure A.

In keeping with the above operational contexts the major apprehensions about potential negative impacts/risks from globalisation process stem from the following factors observed, narrated, assessed and analysed at different levels during the implementation of exploratory research project.

(i) Visible incompatibilities between (a) the imperatives of mountain's bio-physical conditions (inaccessibility, fragility, marginality etc.) shaping the resource use systems/production patterns and people's livelihood strategies on the one hand and (b) the norms and practices (e.g. resource use intensification, profit-driven selectivity and over-extraction etc.) encouraged by globalisation. In other words, the primacy of bio-physical conditions determining the nature and complex of economic activities in mountain areas and the unprecedented primacy accorded to market forces that promote specific patterns and levels of economic activities tend to generate conflicting scenarios with high risk potential.

Globalisation brings new incentives, technologies, financial support systems for selected market wise profitable products and services, which in turn are isolated (and promoted) from inter-linked diversified mountain production systems, leading to disintegration of interlinked diversified sustainable combination of economic activities. Example: specific focus on timber or dairy products leading to disintegration of prevailing farming-forestry-livestock linkages in mountain areas, and selected cash crops picked up from economically and ecologically beneficial integrated cropping systems in parts of HK-H are just two examples.

Due to OGL (open general license) for import/export puts mountain niche products in direct competition with external goods. The latter having better man-made support (funds and technologies) displace the mountain products
from consumer markets. Fruits, flowers, off-season vegetables are some of the examples.

(ii) Due to market’s known tendency to ignore negative externalities created by primacy of interlinked biophysical conditions in mountain areas, there are greater chances of accentuation of existing patterns of over-extraction of mountains’ selected niche resources/opportunities (and ignoring their side effects), following the reduced regulations and liberalization policies. This may accentuate the existing pattern of high land - low land economic links unfavourable to mountain areas.
Table 4: Potential Vulnerability and Risk Enhancing Factors Associated with Globalisation in Mountain Context and Approaches to Adapt to thema)

<table>
<thead>
<tr>
<th>Potential Sources</th>
<th>Elaborations/Examples</th>
</tr>
</thead>
</table>
| (a) Visible incompatibilities between: (I) driving forces of globalisation and (ii) imperatives of specific features of mountain areas (fragility, diversity, etc.) | (i) Market driven selectivity, resource use intensification and over exploitation induced by uncontrolled external demand versus (ii) fragility-marginality induced balancing of intensive and extensive resource uses; diversification of production systems, niche harnessing in response to diversity of resources  
Consequence: Environmental resource degradation; loss of local resource centred, diversified livelihood security options; increased external dependence. |
| (b) Accentuation of negative side effects of past development interventions under globalisation due to their common elements (approaches, priorities, etc.) with adverse effects on mountain areas | Common elements between the past public interventions and market driven globalisation:  
(i) Externally conceived, top-down, generalised initiatives (priorities, programmes, investment norms) with little concern for local circumstances and perspectives, and involvement of local communities  
(ii) Indiscriminate intensification at the cost of diversification of resource use, production systems and livelihood patterns causing resource degradation (e.g., deforestation, land slides, decline in soil fertility, biodiversity)  
(iii) General indifference to fragile areas/people excepting the high potential pockets creating a dual economy/society; over-extraction of niche opportunities (timber, mineral, hydropower, tourism) in response to external (mainstream economy) needs, with very limited local development  
Consequence: Environmental degradation and marginalisation of local resource use systems, practices, and knowledge etc., likely to be enhanced due to insensitiviy of market to these changes and gradually weakened public sector |
| (c) Globalisation promoting erosion of provisions and practices imparting protection and resilience to marginal areas/ people (including disinvestment in welfare activities) | (i) Traditional adaptation strategies based on diversification, local resource regeneration, collective sharing, recycling, etc., likely to be discarded by new market-driven incentives and approaches to production, resource management activities  
(ii) Shrinkage of public sector and welfare activities (including subsidies against environmental handicaps, etc.) depriving areas/people from investment and support facilities (except where externally exploitable niche opportunities exist)  
Consequence: Likely further marginalisation of the bulk of the mountain areas and people. |
| (d) Loss of local resource access and niche-opportunities through the emerging “exclusion process” | Niche resources/products/services with their comparative advantage (e.g., timber, hydropower, herbs, off-season vegetables, horticulture, minerals, tourism etc.) and their likely loss under globalisation through:

i) Market-driven over extraction/depletion due to uncontrolled external demand

ii) Focus on selective niche, discarding diversity of niche, their traditional usage systems, regenerative practices; indigenous knowledge

iii) Transfer of “niche” to mainstream prime areas through market-driven incentives, green house technologies, infrastructure and facilities (e.g., honey, mushrooms, flowers produced cheaper and more in green house complexes in the Punjab plains compared to naturally better suited Himachal Pradesh, India)

iv) Acquisition and control of access to physical resources: forest, waterflows, biodiversity parks, tourist attractions by private firms through sale or auction by government, depriving local’s access, destroying customary rights and damaging livelihood security systems.

**Consequence:**
Loss of comparative advantages to fragile areas or access to such gains for local communities |

| (e) Adapting to globalisation process, possible approaches to loss minimisation | i) sharing gains of globalisation through partnership in primary and value adding activities promoted through market; building of technical and organisational capacities using NGOs and other agencies including market agencies to promote the above

ii) promotion of local ancillary units (run by locals) to feed into final transactions promoted by globalisation; this needs institutional and technical infrastructure and capacity building

iii) provision for proper valuation of mountain areas resources and compensation for their protection, management by local people for use by external agencies

iv) enhance sensitivity of market-driven initiatives to environment and local concern to be enforced by international community and national governments

v) All the above steps need local social mobilisation, knowledge generation and advocacy movements; and policy-framework and support

**Consequence:**
If above steps are followed, there are chances of influencing the globalisation process and reducing its negative repercussion for mountain areas/people |

Source: Table adapted from Jodha (2002b, 2005)
(iii) There are visible indicators of loss of measures imparting protection and resilience to mountain communities, against livelihood risks and vulnerabilities following the marginalisation/erosion of age old adaptation measures. As already seen and reported from the market-access wise progressive areas of HK-H countries, the traditional adaptation strategies characterized by diversified and flexible resource use, resource and product recycling, provisions of common property resources and various collective risk sharing arrangements are on the decline due to new market driven processes, new short term, profit-oriented production choices and practices.

Similarly, the role of public sector is rapidly shrinking, structural adjustment programmes are imposing different norms and rules on potential dependents on welfare and public support systems as reported from Himachal Pradesh and Uttaranchal (India) and parts of Nepal. To sum up the weakening of traditional self-help measure and present day welfare programmes, the break down of social security net is a major risk created by globalisation especially for the poor.

(iv) Erosion of mountains’ niche opportunities/products (e.g. horticulture, off-season vegetables, specific herbs etc.) through the decline of their mainly nature endowed comparative advantages following the promotion of man-made arrangements (through market agencies) in plains is another emerging risk. Focus on more efficient production of traditional mountain products in plains; and initiation of liberal trade policies exposing mountain products to competition without alerting and preparing them for the same are other features of the change.

Which would erode the traditional niche based comparative advantage of mountains. Thus unless mountain products are improved and upgraded, through scientific innovations, the former would lose the nature endowed comparative advantage. To this one should add the promotion of secondary sector activities (e.g. value adding chains) to mountain niche products to enhance their gains in the globalization era.

Viewed from positive angle the facilities and initiatives that helped building competitive products from plains can also be used for enhancing comparative advantages of nature-supported mountain products specially the organic products. This has already been initiated in floriculture in Kunming area of China; several herbal crops by domestication in part of Nepal, Bhutan and India through public-private collaboration involving farmers’ participation. They need up-scaling.
Visible “exclusion” process is another risk. In here communities face alienation from their resources due to acquisition of the latter by private firms and others (now permitted and encouraged by the state); and rapid decline of: traditional rights to resources, disregard of practices, products, provisions, services etc. which helped sustain mountain communities. These sources of risk are seen in many areas including India, China, Pakistan and Nepal.

Besides, mountain communities are largely left out of the change process of positive changes (promoted by globalisation), due to their lack of requisite capabilities, skills and investment resources. To elaborate, mountain people are being excluded from the globalization process (or global economy) through inability to participate in and gain from opportunities offered by the global change. The petty niche harnessed by them is losing in competition from the big firms. The latter have their new links with community leaders as well as local government officials to help them. Many of the farmers are converting in to contract farmers with unequal terms of transactions.

Production and trade-related exclusion mechanisms are further accentuated by resource-centred exclusion. Examples of change in ownership and access to land resources have been reported from different parts of HK-H including Himachal Pradesh and Uttaranchal (India), greater Kathmandu valley and Pokhara valley (Nepal), Swat area of Pakistan part of Tibet autonomous region, Hunan and West Sichuan in China. In many cases community resources (or even privately owned lands) are transferred to corporate sector in the name of development or special economic zones (SEZ) etc.

To the above, the following may be added. In many parts of HK-H people’s access to their traditionally owned or used natural resources is blocked. This is done through declaring such resources as protected areas and wildlife parks etc. under the pressure of national and international environmental groups. Cases of private firms/government agencies acquiring ownership of such facilities also exist.

On the top of all this, the environmental services provided by resource-conservation practices of the people are seldom recognized and compensated (Jodha 2001). However, of late pressure and initiatives are shaping to involve communities in such conservation initiatives and gain there from.
(vi) Finally, due to several common drivers of economic globalisation and global environmental change, such as push for high profitability, focus on selectivity, narrow specialisation etc. leading to reduced diversification and resource regeneration and enhanced resource use intensification, the above risks are likely to be further accentuated, leading to reduced extent and quality of local resource based earning options for mountain communities.

Reduced extent of crop diversification and intensification certain commercial crops including non-food crops, was reported from Kunming area China, Himachal Pradesh, India and parts of Nepal.

By way of concluding the discussion on risks from globalization, some broad steps to adjust to or reduce the risks may be listed. This is done through Table 5 in a very simple manner. The identified steps would directly or indirectly constitute part of the discussion on potential opportunities globalization may offer to mountain areas and communities.

**Table 5: Indicative Broad Steps to Enhance Adaptation Options Against Risks Associated with Globalisation Processes**

| A. Mechanisms to help mountain people share gains of Globalization | – Share in primary and value adding activities based on mountain-located opportunities promoted by globalisation  
– Partnership with external market agencies  
Equitable terms of trade (under highland – lowland economic links) |
|---|---|
| B. Strengthening local participation in harnessing of mountain niche | – Complement nature-endowed niche with human made niche facilities  
– Ancillary role in harnessing of key resources (e.g. hydropower, NTFPs etc.) by external agencies |
| C. Arresting Exclusion process | – Partnership in enterprises based on assets taken from local people (e.g. in eco-tourism; SEZ projects)  
– Adequate compensation for unavoidable exclusion (i.e. loss of asset, opportunities due to global process) |
| D. Integration of mountain economies with rest of the world on equal terms | – Capacity building for it  
– Partnership with external agencies |
| E. Global advocacy and concessions | – With special problems of mountains, provision for special window (exceptions to WTO rules) to help mountain areas  
– International concern and mobilization dialogue supporting mountains for their contributions to global commons (fresh water, bio-diversity, hydropower helping downstream communities and economies) |
Potential Opportunities

Notwithstanding the above negative prospects, globalisation is not necessarily a source of gloom and doom. It also creates potential for new opportunities for mountain areas, where the latter can have comparative or exclusive advantage. Even when the globalisation induced changes carry both risks and opportunities for mountain areas/communities, due largely to the factors such as: the lack of both sufficient information and concrete visibility of positive opportunities, absence of facilities and capacities to materialise the potential opportunities, and the past experience of market led or public sector led change in mountain areas generating several negative side effects etc., the discourse on the subject is generally dominated by the perspectives that project risk aspect more than the opportunity aspect. Hence, any effort highlighting the potential opportunities created by globalisation carries the risk of being interpreted as a piece of loud thinking. With this caution, we may summarise the findings and insights generated by the exploratory research. However, this should be noted that the realisation of most of these potential opportunities requires capacity enhancement of mountain economies/communities and conscious effort on the part of external agencies to link mountain economies as equal partners in the change process.

(i) The first and foremost category of potential opportunities relates to the specific mountain products and services (such as medicinal herbs, flowers, other organic products, mountain tourism etc.) with global demand, in which these areas may have comparative or exclusive advantage.

(ii) The increased information, awareness and capacities of mountain communities generated through their enhanced links and partnership with the external agencies is another important source of opportunities. This can help in making mountain innovations products/services more efficient and competitive in the global market.

(iii) The possible complementing of the mountain area’s nature-endowed niche by human made (niche promoting) facilities, through support from more resourceful global agencies, once they get attracted by the untapped or poorly tapped potential of mountain areas, is yet another potential opportunity.

(iv) Quite related to the above is the possibility of relaxation of the biophysically determined constraints (poor access, isolation, fragile slopes, as well as marginality of mountain areas and communities), with the enhanced links with global agencies/processes having sufficient technological and
financial resources, once they are induced to harness/develop mountain resources for their global (and by implications local) gains. Examples of private sector’s entry into infrastructural development and support services have already emerged in different mountain areas.

(v) What has been stated above also applies to managing the risks emanating from different mountain specificities. Accordingly, the globalisation led initiatives can address incompatibilities between imperatives of mountain specificities (fragility etc.) and the implications of driving forces and operational mechanisms of globalisation. For instance the globalised (more resourceful) system would have new technologies and means for: promoting high value products with low intensity land use for fragile areas; road construction techniques with little damage to fragile slopes; promotion of marginal areas through increased investment and appropriate technologies; human capacity enhancement in marginal communities with institutional and financial support (as it is already initiated in some areas); evolving high pay off resource diversification approaches using new technological and management systems; enhancing mountain niche; upgrading traditional technologies etc. These are some of the potential possibilities to help mountains through resourceful external market agencies.

7 Realisation of Potential Opportunities

However, the realisation of the above mentioned potential opportunities assumes, more pro-active and positive role of private sector (in association with NGOs, governments and communities) to help sustainable development of mountain areas. Notwithstanding the doubts on such perspectives from different quarters, this may be not an unconceivable possibility for the following reasons.

(i) First, global profitability and competitiveness of any private firm, dealing in mountain products, resources services etc., based solely on resource extraction, can not be sustained for long. Hence, in order to maintain their edge in the global market, such firms would be induced or compelled to focus on resource regeneration and support the processes leading to this.

(ii) Secondly, in view of the mountains being a major source of many global public goods (different environmental services, unique biodiversity, fresh water, hydro-power, herbal products and unique indigenous knowledge systems, eco-tourism etc.), the pressure is likely to build on the agencies benefiting from mountain areas, to invest in mountains and simultane-
ously address the concerns for high productivity and resource conservation in mountain areas. Global attention to such issues is already increasing through various activities and Fora such as mountain agenda during Rio Earth Summit 1992, the International Year of Mountains (2002), promotion of mountain partnership following WSSD (2002). Of late in the context of climate change and associated problems, mountains are accorded a central place in understanding and addressing the issues. However, this should be admitted that the promotion of social responsibilities of private business sector, implied by the above formulation, may not be an easy task. However, by using certain special provisions of WTO regulations, such possibilities can be enforced.

(iii) Finally, under the current pattern of unequal highland – lowland economic links, most of the resource/product/service flows from mountain areas to the downstream economies are free or poorly compensated. Once “market” becomes key driving force behind economic links, the mountain resources or rather environmental services provided by them would have to be realistically priced. The agencies using such services would be made to pay for the negative externalities of their activities. This may result in to enhanced resource conservation and increased financial flows to mountain areas for development and welfare activities.

(iv) To promote and harness the above mentioned potential opportunities, the enhancement of local capacities and increased advocacy of mountain concerns at global fora are essential steps. These tasks are already on the advocacy agenda of above mentioned initiatives (e.g. mountain partnership etc.). The possibilities indicated above should form the part of mountain economies’ adaptation strategies in the context of economic globalisation and global environmental change.

8 References


Jodha, N.S. (2002b) *Globalisation and Impacts on Upland Poor*. Paper Presented at IFAD South Asia Portfolio Review, (22–26 May), Paro, Bhutan.


Annexure A

List of field notes, observation briefs and papers etc. from different mountain areas used as information sources for analyzing the repercussions of globalisation for mountain areas

1. Areas/products to be influenced by globalisation in Chinese Himalayan Mountains by Y. Zhao, (2001).


3. Commercialisation of Vegetable Production in Aba Mountain Area (West Sichuan, China), by Fu Shou Ning and Yao Shou Fu, (2001).


19. China, WTO and Pakistan (E-mail communication), by J. Burki, (2001).


3 Regional Exchange and Cooperation: Country Perspectives

3.1 Peoples Republic of China

Xinjiang and Tibet are the two largest landlocked mountain regions of western China that are inhabited mainly by ethnic minorities. The central and local governments have been attaching great importance to developing the local economy, conserving natural resources, protecting the environment and reaching out to pastoral communities to improve their livelihood conditions and getting them out of poverty.

Both the regions are strategically placed and bordered with 13 countries including, Russia, Mongolia, Kazakhstan, Kyrgyzstan, India, Pakistan, Nepal, Bhutan, Afghanistan, Tajikistan and Myanmar. In this context, Regional Exchange and Cooperation (REC) is at the core of the central and regional governments economic policy planning. China is actively promoting REC in the field of border trade and investments with many neighbouring countries and regions including Pakistan, Nepal, Tajikistan and others.

However, there is a realization that such local efforts alone are not sufficient to achieve sustainable mountain development. Therefore, scaling up long-term regional exchange and cooperation in relevant fields are critically important.

3.1.1 Factors Influencing REC

Trade, good transportation and friendly relations with neighbouring countries are major factors influencing REC with varying degrees with the neighbouring countries in the region. Border and state security issues including terrorism, drug trafficking, smuggling, crimes and issues like custom tariff structures, port handling facilities, boundary protection and disputes etc. Are some of the factors that either promote or restrict regional exchange and co-operation.
Major factors that promote regional exchange and cooperation are political stability, policy of non-interference in each others affairs, good bilateral relations, respecting local cultural, religious and minority traditions and rights, free monetary exchange, information sharing and development of sound infrastructure for communication and transportation of goods.

Other factors include natural resource management including livestock movement and disease prevention, monitoring of wildlife movement and data sharing, protection and sharing of water resources, disaster risk reduction and disaster responses across the borders.

In order to benefit from the opportunities for regional exchange and cooperation, there is a need for concerted and integrated efforts by the various actors both at the policy and implementation levels both at central and the local government levels in the two regions.

At the central level, the Peoples Congress, national reform commission, foreign affairs department, state forest administration, scientific research academies, hydroelectricity department, state land department, natural disaster and environment department and the regional development planning bodies are involved in formulating policies and plans for regional exchange and cooperation. At the local and regional level trade and tourism departments, agriculture and livestock departments, state and private enterprises, farmers and herder groups.

3.1.2 Opportunities for REC

The regional development plans for Tibet and Xinjiang need to proactively address the challenges and opportunities offered by REC. There is a need to develop policies and plans related to conservation of mountain ecology, hydropower generation, scientific research capacities related to mountain environments taking a regional perspective. Mainstreaming of environment and cultural heritage into larger economic development agenda and making it part of the thinking of the educational and state policy apparatus will also benefit larger national and regional economic integration.

Similarly, boosting cross-border trade, movement of goods and services, creation of special border economic zones, promotion of regional enterprises and exchange of agricultural commodities will promote regional exchange and economic integration.
Promotion of agro-forestry, taking an ecosystem and a landscape approach to protect the mountain environments and livelihood, animal and plant quarantine and sharing agricultural know-how and technologies will promote sustainable agricultural development, generate wealth and economic growth and help reduce poverty.

There is a need to develop capacities of local people, government departments, academia and the private sector in order to promote regional exchange and cooperation. The governments in collaboration with international agencies need to embark upon a strategy for capacity development which mainly focuses on providing technical advice, creating an enabling environment for REC, training, language skills and organizing forums and events for exchange of information, experiences and lessons across the borders and creating virtual spaces for knowledge development and sharing. Access to capital, science and technology, new concepts of market development and market economies and developing the supply and demand sides of economic development in this economically underdeveloped areas are also important areas for capacity developed.

### 3.2 Nepal

The current priorities for regional exchange and cooperation are mainly geared towards tourism development. Exchanges between Nepal, Tibet and India related to trade and tourism has strong impact on improving the livelihoods of the rural people in the border regions.

Major exchanges that take place across the borders include horticulture products, off-season vegetables, tea, herbs, timbers, and honey and utility goods. Exchanges across the border with Tibet in livestock trading, mountain herbs and non-timber forest products with India are growing, and there is significant increase over the years in amount, type and magnitude of exchange and cooperation.

Over the years, Nepal has grown into a major mountain tourist destination in the Himalayas region. Mountain tourism includes adventure to Mount Everest, spiritual/pilgrimage tourism, community-based and eco-tourism. Approximately 500 tourists arrive per day in the tourism season, and there are huge potentials still unutilized and current destinations are limited to some pockets. Tourists arrive via India and Bangladesh. Besides regional tourists, Nepal receives one
of the highest mountain tourists from North America, Japan, and South Korea and European countries.

3.2.1 Factors Influencing REC

Factors influencing regional exchange and cooperation between mountain regions include; infrastructure and road conditions, political situation, custom and tariff rates and policies related to import and export of goods and services, level of availability of information about markets and tariff structures, availability of testing/certification facilities and capacities at the border ports, technological and scientific knowledge about products, processing and value addition, and safety and security issues about travel and protection of investments etc.

In order to boost tourism as a regional exchange and cooperation instrument there is a need to invest in generating electricity, mainly hydropower generation, improving the service quality of hotels and leisure industries, providing training to rural communities in managing tourism products, and creating social security and competitive labour wages for seasonal porters and workers linked to the tourism industry. In the new Nepal, there is a need to boost the image of Nepal as an ideal tourist destination through media coverage and bringing international investment funds to promote Nepal as a regional hub for tourism at the cross roads of Himalayas and South Asia.

3.2.2 Opportunities for REC

There are huge potentials for regional exchange and cooperation in other fields also, mainly industrial production, water resource management, mineral exploration and agro-forestry development, developing mechanisms like carbon trading and payment for environmental services to address challenges of climate change. Besides Nepal has per capita highest number of non-governmental organizations and many international organizations have worked and are working in Nepal on developing and testing sustainable mountain development strategies. This knowledge, education and learning could be shared with mountain regions.
3.3 Pakistan

The Federally Administered Northern Areas of Pakistan is strategically placed in the mountain region in the Karakoram-Hindukush-Himalayas and Pamirs. It is bordered with Xinjiang, Indian controlled Kashmir, Pakistan Administered (Azad) Kashmir, NWFP province of Pakistan, Afghanistan and Tibet.

The Northern Areas has a subsistent agriculture economy and over the last two decades potato and horticulture products have emerged as cash crop, and are exchanged with southern parts of Pakistan.

Pakistan has a functioning border trade with Xinjiang Province of China through the Khunjerab Pass. A number of goods are exported to China that includes marble and Onyx handicrafts, leather products, chilghoza nuts etc. China trades hundreds of industrial, electrical, electronic, silk fabric and fruits across the border.

3.3.1 Factors Influencing REC

Factors that promote regional exchange and cooperation are friendly and peace loving people of the Northern Areas, Pakistan-China good relations, availability of border pass facility for residents, businesspeople and officials of Northern Areas and Xinjiang to travel across the border, Karakoram highway criss-crossing Pakistan and China, serving as key lifeline and communication link, and strategic importance of the corridor as an important trade and transportation link between Central Asia and Gwadar sea port.

Factors that restrict regional exchange and cooperation include seasonal business and closure of the border between December and April due to extreme weather conditions, lack of air access between Northern Areas and Xinjiang, absence of Chinese visa issuing authority in Gilgit and Pakistani authority in Xinjiang (Kashi), lack of decentralized governance structure and concentration of authority in Islamabad and uneasiness about extremism and terrorism.

3.3.2 Opportunities for REC

In the mid-term future there are many opportunities coming up to promote REC. construction and opening of the dry port facility at Sost with Chinese
investment and management, widening of the KKH, improvement of the Gilgit airport, construction of Diamer-Basha Dam and creation of energy corridor to reach Gwadar port city, provides many macro and micro-economic opportunities for regional cooperation.

### 3.4 Tajikistan

The Gorno Badakhshan Autonomous Oblast (GBAO) is a landlocked and mountainous region of Tajikistan which has during the last decade or so developed strategies for regional exchange and cooperation with neighbouring regions like Osh Province of Kyrgyzstan and Badakhshan province of Afghanistan and Xinjiang province of China. Major fields of REC are infrastructure and communication, cross-border trade, natural resource management, social-cultural exchanges and tourism.

Three bridges were constructed across the river Panj with Afghanistan between 2002 and 2007, and another bridge will be completed in 2009. A motorway was completed between China and Tajikistan through the Kulma Pass in 2002.

In the field of cross-border cooperation, simplification of transit and visa procedures is facilitating trade, labour migration, access to technology, agricultural commodities and hydropower supply.

In the socio-cultural sphere a number of cultural exchanges and festivals and exhibitions are being organized, besides educational training exchange programmes and provision of health services.

In natural resource management areas like conservation of biodiversity, use of water resources, promotion of renewable energy and promotion of eco and cultural tourism are some of the fields of cooperation.

A number of institutions both state and civil society and international agencies are involved in promoting REC. Local entrepreneurs and tour companies and officials of the regional governments are actively promoting the cooperation.
3.4.1 Factors Influencing REC

The major factors positively influencing regional exchange and cooperation are agreements and protocols between the governments, political stability, simplified visa procedures, better communication infrastructure, common cultural bonds and heritage and interest by international donors and agencies. However there are restricting factors like inadequate infrastructure, visa issues, restrictions for citizens of other countries to cross borders, seasonal nature of border activity, drug trafficking and heavy tariff and custom duties on certain goods.

3.4.2 Opportunities for REC

There are a number of initiatives ongoing and in the pipeline providing opportunities for boosting regional exchange and cooperation, namely construction and reconstruction of new bridges and road between Tajikistan, China, Afghanistan and Pakistan, creation of free economic zones along the border with Tajikistan-China and Afghanistan and opportunities for flow of tourists through Kulma Pass.

Construction of the Khorog campus of the University of Central Asia (UCA), regional agreements on transit trade between Central Asian States, China and Pakistan along the Karakoram highway and agreements on hydro power generation and supply to third countries and promotion of trans-boundary biodiversity conservation corridors in the Pamirs provide opportunities for strengthening REC.

Ongoing international donor supported projects focusing on a regional strategy including Inwent-ICIMOD programme also provide opportunities for cooperation.
The economics of water resources management suggests that water should be allocated efficiently among its users by taking an integrated approach to water resources management. This approach is based on the need to take advantage of “externalities” while planning water management: the externalities reflected in the upstream-downstream linkages. However, due to the public-good characteristics of water resources, “free-rider” opportunities for downstream nations discourage upstream nations from taking a lead. Nevertheless, increasing concerns regarding quality and quantity water, not to speak of energy potentials and environmental hazards, have enhanced needs for cross-border co-operation. In the Greater Himalayan Region, river basins of the nine rivers originating in the Region, also known as the Third Pole or Water Towers of Asia, are home to more than 1.3 billion people. For the countries in the region, the science of glaciers and fresh water supply points out the need to think and act seriously about cross-border co-operation for developing and managing water, even more urgently than the economic literature summarized above, might suggest. Global climate change is expected to have serious consequences on the water related eco-system services, and thereby on livelihoods in this region. A review of treaties among riparian nations on international rivers in the greater Himalayan region, however,
does not seem to reflect the concerns that these scientific or economic principles suggest. While the legal scholars continue with their fine efforts to further institutional mechanisms, this paper suggests that the perspective of regional economic cooperation may help to further refine the content of their works and to expedite the implementation of these mechanisms for cross-border cooperation on water. Such a perspective of regional economic cooperation goes beyond the focus on water alone, but would be based on water as a natural resource of central focus, around which cross-border economic exchange, primarily trade, and the development of infrastructure to facilitate it, take place.

1 Introduction

Global climate change is expected to have serious consequences on the water related eco-system services and thereby on people’s livelihoods in the Himalayan region. In the greater Himalayan region, the river basins of the nine rivers originating in the Region, also known as the Third Pole or Water Towers of Asia, are home to more than 1.3 billion people (see Table 1). Due to a rapid change in Himalayan glaciers and its consequences for environmental hazards, such as glacier lake outburst floods and for water stress due to declining fresh water supply, there is a need to think and act seriously about cross-border cooperation in the region for managing water resources and water-related hazards.

In the literature, the economics of water resources management suggests the need to take advantage of “externalities” while planning water management: the externalities reflected in the upstream-downstream linkages, whether it is for communities, districts and provinces within national borders, or across international boundaries. Furthermore, due to the public-good characteristics of water resources, “free-rider” tendencies and opportunities for downstream nations also discourage upstream nations from taking a lead in water resources conservation and management. However, increasing concern regarding quality and quantity of water, not to speak of potential natural hazards related risk of water-induced disasters have indicated potentials for cross-border co-operation. Furthermore, while the Integrated Water Resources Management (IWRM) is an approach currently being promoted by water scientists and economists alike for managing trans-boundary water, the overriding importance of climate change as a driver of environmental change makes IWRM even more important to address flood related natural hazards and water-scarcity related concerns in a holistic manner.
A quick review of treaties among riparian nations on international rivers in the greater Himalayan region reflects that the actual practice in cross-border cooperation is different from the ideal paradigm scientific or economic principles may suggest. While the legal scholars continue with their fine efforts to further institutional mechanisms for cross-border cooperation on water, a perspective of regional economic cooperation that goes beyond the focus on water alone has been recently discussed. This perspective would be based on water as a natural resource of central focus, around which cross-border economic exchange, primarily trade, and the development of infrastructure to facilitate it, take place.

This paper is organized as flows. Part I presents an overview of the fundamental factors leading to cross-border water-related conflicts and likely avenues for cooperation. In this context, two examples of cooperation are discussed, one motivated by opportunities for trade in hydroelectricity and the other by adaptation to climate change due to upstream-downstream linkages. Part II presents a brief review of treaties among riparian nations on international rivers. It then discusses in detail the Indus Waters Treaty has been successfully implemented for more than four decades. Among the treaties on international waters signed between the countries in the Himalayan region, if the endurance were to be considered a test of a treaty’s success, the Indus Waters Treaty would definitely be a success story. The state of international cooperation on water is, however, limited by the fact that governments tend to negotiate agreements on benefit-sharing in very specific areas of cooperation, such as hydroelectric power trade, without consideration of the holistic approach. While the Integrated Water Resources Management (IWRM) is an approach currently being promoted by water scientists and economists alike for trans-boundary water management, the overriding importance of climate change as a driver of environmental change makes IWRM even more important to address flood related natural hazards and water-scarcity related concerns in a holistic manner. The problem lies, however, in the implementation of such a strategy. Interestingly enough, such an environment may be feasible only if we can also consider within the basket of benefits resulting from cooperation, indirect economic benefits ‘beyond water’, although water will be the natural resource of main focus.

Part III discusses how such a perspective of regional economic cooperation may help to further refine the contents of international treaties and to expedite their implementation. It then discusses the case of the Greater Mekong Sub-region as an initiative towards that approach. The Mekong River Basin Agreement of 1995 is an example of treaty that emphasizes IWRM. In its Mekong River Commission, however, the absence of China and Myanmar has prevented basin-wide
management. Nevertheless, these countries have joined with the MRC countries in the Greater Mekong Sub-region (GMS) program, which is envisaged from the perspective of regional economic cooperation. Such a perspective of regional economic cooperation goes beyond the focus on water alone, but would be based on water as a natural resource of central focus, around which cross-border economic exchange, primarily trade, and the development of infrastructure to facilitate it, take place. Part IV provides a summary of lessons learned for cross-border cooperation on water resources.

2 Conflict and cooperation

Prior to indulging in details of the discussions on treaties and institutional mechanisms for cooperation on international rivers in the Greater Himalayan Region, this section presents an overview of the fundamental factors leading to cross-border water-related conflicts and likely avenues for cooperation and discusses those factors using examples drawn from the greater Himalayan region, whose basic statistics are summarized in Table 1.
Table 1: Principal Rivers of the Himalayan region – Basic Statistics

<table>
<thead>
<tr>
<th>River</th>
<th>Area, sq km</th>
<th>Mean discharge (m³/s)</th>
<th>% of Glacier melt in river flow</th>
<th>Population x1000</th>
<th>Population density</th>
<th>Water availability per person m³/year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indus</td>
<td>1,081,718</td>
<td>5,533</td>
<td>44.8</td>
<td>178,483</td>
<td>165</td>
<td>978</td>
</tr>
<tr>
<td>Ganges</td>
<td>1,016,124</td>
<td>18,691</td>
<td>9.1</td>
<td>407,466</td>
<td>401</td>
<td>1,447</td>
</tr>
<tr>
<td>Brahmaputra</td>
<td>651,335</td>
<td>19,824</td>
<td>12.3</td>
<td>118,543</td>
<td>182</td>
<td>5,274</td>
</tr>
<tr>
<td>Irrawaddy</td>
<td>413,710</td>
<td>13,565</td>
<td>Small</td>
<td>32,683</td>
<td>79</td>
<td>13,089</td>
</tr>
<tr>
<td>Salween</td>
<td>271,914</td>
<td>1,494</td>
<td>8.8</td>
<td>5,982</td>
<td>22</td>
<td>7,876</td>
</tr>
<tr>
<td>Mekong</td>
<td>805,604</td>
<td>11,048</td>
<td>6.6</td>
<td>57,198</td>
<td>71</td>
<td>6,091</td>
</tr>
<tr>
<td>Yangtze</td>
<td>1,722,193</td>
<td>34,000</td>
<td>18.5</td>
<td>368,549</td>
<td>214</td>
<td>2,909</td>
</tr>
<tr>
<td>Yellow</td>
<td>944,970</td>
<td>1,365</td>
<td>1.3</td>
<td>147,415</td>
<td>156</td>
<td>292</td>
</tr>
<tr>
<td>Tarim</td>
<td>1,152,448</td>
<td>146</td>
<td>40.2</td>
<td>8,067</td>
<td>7</td>
<td>571</td>
</tr>
<tr>
<td>Total</td>
<td>1,324,386</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Factors leading to cross-border water-related conflicts: Some of the critical indicators of vulnerability to conflict among the nations due to water availability are the per capita water availability, the level of water withdrawals for annual use in relation to its availability, and the extent of dependence on water resources that flow in from their borders. Table 2 shows the per capita water availability and this value from 2000 and 2005.
Table 2: Per capita Water Availability in 2000 and 2005 (cubic meters/person/year)

<table>
<thead>
<tr>
<th>Country</th>
<th>Basin Name</th>
<th>Population, Thousands</th>
<th>Per Capita Water Availability* 2000</th>
<th>Per Capita Water Availability* 2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>Indus, Tarim</td>
<td>24,926</td>
<td>2,986</td>
<td>2,610</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>GBM</td>
<td>149,664</td>
<td>8,809</td>
<td>8,090</td>
</tr>
<tr>
<td>Bhutan</td>
<td>GBM</td>
<td>2,325</td>
<td>45,564</td>
<td>40,860</td>
</tr>
<tr>
<td>China</td>
<td>GBM, Indus, Tarim</td>
<td>1,320,892</td>
<td>2,259</td>
<td>2,140</td>
</tr>
<tr>
<td>India</td>
<td>GBM, Indus</td>
<td>1,081,229</td>
<td>1,880</td>
<td>1,750</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>Tarim</td>
<td>15,403</td>
<td>6,778</td>
<td>7,120</td>
</tr>
<tr>
<td>Kyrgyzstan</td>
<td>Tarim</td>
<td>5,208</td>
<td>4,182</td>
<td>3,950</td>
</tr>
<tr>
<td>Myanmar</td>
<td>GBM</td>
<td>50,101</td>
<td>21,898</td>
<td>20,870</td>
</tr>
<tr>
<td>Nepal</td>
<td>GBM</td>
<td>25,725</td>
<td>9,122</td>
<td>8,170</td>
</tr>
<tr>
<td>Pakistan</td>
<td>Indus, Tarim</td>
<td>157,315</td>
<td>2,961</td>
<td>1,420</td>
</tr>
<tr>
<td>Tajikistan</td>
<td>Tarim</td>
<td>6,298</td>
<td>2,625</td>
<td>2,540</td>
</tr>
</tbody>
</table>

Source: FAO’s AQUASTAT 2005

*Water Availability: Total Actual Renewable Water Resources

The critical stress level of water availability, where users would start to feel shortage of water, has been identified 1700 cubic meters per person per year. And some hydrologists have estimated 1000 cubic meters per person per year as a minimum water requirement for a moderately industrialized nation that uses water efficiently. In the region (Table 2), the annual water availability for Pakistan is already below the critical stress level in 2005, and by judging from the rate at which it has been declining between 2000 and 2005, it may soon fall below the minimum level. The data shows that India, China, Tajikistan and Afghanistan are also the water-limited nations in the region, where the annual water availability are quickly approaching the critical stress level.

Just as population growth could adversely affect the demand side, climate change may have a serious effect on the supply side of water resources management. Table 3 presents the ratio of annual water withdrawals (demand) to annual renewable
water availability (supply). Among the countries in the region, the level of water demand is about three-fourth of the level of supply in Pakistan and Tajikistan, and about one-half in Kyrgyzstan. This would suggest that there might be water shortages in these countries if the water supply decreases due to adverse consequences of climate change. Normally, levels of demand greater than one-third of supply have been considered risky. On the other end, the ratio is less than 5% in Myanmar and Nepal, which is an indicator of the vast potential of underutilized water resources that these countries might be able to tap without harming the riparian nations.

Table 3: Ratio of Water Demand to Supply by Country

<table>
<thead>
<tr>
<th>Country</th>
<th>Basin</th>
<th>Water Withdrawals* as a Percentage of Renewable Supply**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>Indus, Tarim</td>
<td>36%</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>GBM</td>
<td>7%</td>
</tr>
<tr>
<td>Bhutan</td>
<td>GBM</td>
<td>NA</td>
</tr>
<tr>
<td>China</td>
<td>GBM, Indus, Tarim</td>
<td>NA</td>
</tr>
<tr>
<td>India</td>
<td>GBM, Indus</td>
<td>34%</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>Tarim</td>
<td>32%</td>
</tr>
<tr>
<td>Kyrgyzstan</td>
<td>Tarim</td>
<td>49%</td>
</tr>
<tr>
<td>Myanmar</td>
<td>GBM</td>
<td>3%</td>
</tr>
<tr>
<td>Nepal</td>
<td>GBM</td>
<td>5%</td>
</tr>
<tr>
<td>Pakistan</td>
<td>Indus, Tarim</td>
<td>76%</td>
</tr>
<tr>
<td>Tajikistan</td>
<td>Tarim</td>
<td>75%</td>
</tr>
</tbody>
</table>

Source: FAO’s AQUASTAT 2005
*Water Withdrawals: Total Use
**Renewable Supply: Total Actual Renewable Water Resources.

Since the countries in the region fall in the three river basins of Indus, Ganges Brahmaputra, Meghana (GBM) and Tarim, the extent to which water resources are shared would be an important indicator of vulnerability to competing inter-
ests among the nations in the region. Table 4 presents data on the fraction of the total water supply of the countries that originates outside their borders and that flows across from their borders to other nations. Both Bangladesh and Pakistan receive more than three-fourths of their surface water supply from across their borders, mainly from India. Furthermore, although only about one-third of water supply to India originates outside its borders, almost three-fourth of the surface water during the dry season in its fertile Ganges basin with a high population density flows from Nepal. These interrelationships between Bangladesh, India, Nepal and Pakistan in the Indus and the GBM basin may give rise to frictions and tensions over water in the region.

Table 4: Dependence on Imported Surface Water

<table>
<thead>
<tr>
<th>Country</th>
<th>Basin</th>
<th>Percent of Total River Flow Originating Outside of Border</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>Indus, Tarim</td>
<td>15%</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>GBM</td>
<td>91%</td>
</tr>
<tr>
<td>Bhutan</td>
<td>GBM</td>
<td>0.4%</td>
</tr>
<tr>
<td>China</td>
<td>GBM, Indus, Tarim</td>
<td>1%</td>
</tr>
<tr>
<td>India</td>
<td>GBM, Indus</td>
<td>34%</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>Tarim</td>
<td>31%</td>
</tr>
<tr>
<td>Kyrgyzstan</td>
<td>Tarim</td>
<td>0%</td>
</tr>
<tr>
<td>Myanmar</td>
<td>GBM</td>
<td>16%</td>
</tr>
<tr>
<td>Nepal</td>
<td>GBM</td>
<td>6%</td>
</tr>
<tr>
<td>Pakistan</td>
<td>Indus, Tarim</td>
<td>76%</td>
</tr>
<tr>
<td>Tajikistan</td>
<td>Tarim</td>
<td>17%</td>
</tr>
</tbody>
</table>

Source: FAO’s AQUASTAT 2005

*Potential areas for cross-border cooperation on water:* The literature suggests that although cooperation can occur when mutual benefits are possible, such an existence is not sufficient for cooperation to take place, and there is a need to ask three questions: (a) are there truly potential mutual benefits, or is it a situation
where one party can benefit only at the cost of the other, (b) if so, can the situation be redefined to transform it to one of potential mutual benefit, and (c) what are the impediments to actually achieving mutual benefits (Crow and Singh, 2000). Cooperation between India and Pakistan in the Indus river basin is considered as a good example of the situation being redefined to transform it into one of potential mutual benefit by enlarging the size of the pie rather than just dividing it.

The principal potential benefits of cooperation in water resources are: (a) sharing information for flood forecasting and early warning, (b) storing water in upstream river basins for flood moderation, (c) storing water resources for increasing flow in dry seasons, (d) storing water for inland water transport, (e) harnessing water resources to generate hydroelectricity, and (f) managing watersheds to help increase the quality and quantity of water available for irrigation and drinking water by downstream users. The type of exchange of benefits between the countries may be: (a) bilateral barter, which is subject to the need to find a “double coincidence of wants” or (b) a financial transaction, based on the payment of a mutually-agreed upon monetary value for the environmental services delivered. Table 5 lists what the governments of Bhutan, India and Nepal have sought from each other to benefit mutually from the development of water resources in the GBM basin.
Table 5: A simple framework to study potential water-related international transactions between Bhutan, India and Nepal

<table>
<thead>
<tr>
<th>Potential parties</th>
<th>Good or service</th>
<th>Type of exchange Anticipated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bhutan to India</td>
<td>Supply of hydroelectric power*</td>
<td>Monetized</td>
</tr>
<tr>
<td>Bhutan to India</td>
<td>Supply of water storage benefits*</td>
<td>Barter exchange</td>
</tr>
<tr>
<td>India to Bhutan</td>
<td>Navigation and transit*</td>
<td>Barter exchange</td>
</tr>
<tr>
<td>India to Bhutan</td>
<td>Provision of finance and engineering for construction*</td>
<td>Partly monetized</td>
</tr>
<tr>
<td>Nepal to India</td>
<td>Supply of hydroelectric power*</td>
<td>Monetized</td>
</tr>
<tr>
<td>Nepal to India</td>
<td>Supply of water storage benefits*</td>
<td>Barter exchange</td>
</tr>
<tr>
<td>India to Nepal</td>
<td>Navigation and transit*, *</td>
<td>Barter exchange</td>
</tr>
<tr>
<td>India to Nepal</td>
<td>Provision of finance for construction*</td>
<td>Monetized</td>
</tr>
<tr>
<td>India to Nepal</td>
<td>Provision of engineering expertise*</td>
<td>Probably monetized</td>
</tr>
</tbody>
</table>

Source: Crow and Singh 2000
#: occurring to some extent
*: discussed
**: suggested

2.1 A Simple Example of Cooperation

Out of the six potential areas of cooperation on water resources identified above, mutual cooperation on supply of hydroelectric power is probably the one chosen widely among riparian nations. In the following paragraphs, examples of such cooperation arrangements in the GBM basin are discussed.

The opportunities for cross-border cooperation between India and its neighbors, Bhutan and Nepal, on hydroelectricity were enhanced by two major developments in India related to the power sector, one physical and the other institutional. At the physical level, hydroelectric power-grid interconnections in India evolved from the local level in the 1950s to the provincial in the 1960s, and then on to the regional in the 1970s and finally to the national level in the 1990s. For the development of transmission and power-grid interconnections, the Power Grid Corporation was given responsibility for: (a) the development of the national grid by interconnect-
ing the five regional grids, (b) establishing the national load dispatch center, and (c) modernizing the regional and provincial load dispatch centers.

At the institutional level, India promoted the establishment of trading companies, such as the government-supported Power Trading Corporation (PTC), to promote power market. As these physical and institutional setups succeeded within its borders in India, they started exploring cross-border sources of power for interconnections and trading. From India's perspective, as the PTC sees it, the rationale for long-term cooperation in energy are: (a) to take advantage of the potential for economies of scale as a result of large cross-border projects set up primarily to address opportunities provided by India’s shortage situation; and (b) to use cross-border renewable energy sources for environmental and conservation benefits, among others. And, they have identified major constraints to cross-border power trading as: (a) transmission infrastructure and wheeling facilities within the boundaries, (b) inter-grid synchronization for cross-border interconnections, and (c) electricity pricing.

Worldwide, cross-border grid interconnections are on the rise. Interconnections already exist in North America, Europe, and Southern Africa, including the Nord Pool (Denmark, Finland, Norway and Sweden), and the South African Power Pool (12 countries). India intends to use its recent domestic experience in regional grid interconnections for expanding to cross-border grid interconnections. India’s existing major cross-border interconnections are with Bhutan: Chukha hydroelectric project (336 MW) interconnected at Birpara in India, and Tala hydroelectric project (1020 MW), at Silguri in India.

For electricity pricing, the power trading companies act as “market makers” negotiating prices separately with the producers (generators) and distributors, and thus taking the “market risk”, which they tend to diversify by dealing with a large number of buyers and sellers, in what is a suppliers’ market as of now. The trades are largely short term, duration less than one year, although efforts are being made to increase the long term ones, towards a seventy-thirty short-term to long-term mix.

However, such cooperation in hydroelectric power can take place only after the necessary legal provisions are agreed upon by the two countries. The India-Nepal Power Trade Agreement signed on June 5, 1997, but yet to be ratified by the Nepalese legislature, is an umbrella agreement for power trading between the two nations. It goes a step ahead of the agreements between Bhutan and India dedicated to the specific hydroelectric projects. The India-Nepal agreement provides unlimited marker access for power trading. Any party in India or Nepal may
enter into a power trade agreement: government, semi-governmental, or private enterprise (see, Article 1). It also makes a provision for the market mechanism to decide on the price and the quantity of electricity to be delivered at a mutually agreed-upon destination, without any form of government intervention (see, Article 2). In some form, the agreement has already been used as a basis for the power trading agreement between the Power Trading Corporation of India and the Snowy Mountain Engineering Corporation (SMEC) for the sale of power to be generated at the 750 MW West Seti project in Nepal. Once it is brought to full practice, it may be a best practice example of cooperation in power trade between riparian countries. To realize such opportunities for cooperation in hydropower generation may, however, it may be increasingly necessary to take adaptation measures to face potential glacier lake outburst floods in the region.

2.2 A Simple Example of Upstream-Downstream Linkages

Climate change has introduced a new dimension to the potential benefits of cooperation in the context of upstream-downstream linkages. Temperature changes in the Himalayas have been much higher than the global average. Warming in Nepal has been recorded an increase of 0.6 degree centigrade every 10 years between 1977 and 1999 (Shrestha, et al, 1999). Also, warming in Tibet has been progressively greater with elevation (Liu and Chen, 2000). The glaciers of the Himalayas, especially in the eastern and central regions, have been shrinking at an accelerated rate in recent decades. Such drastic reduction in ice cover has not, however, been observed in the northwestern Himalayas, Karakorum, Hindu-Kush, or the Pamirs (Xu, et al, 2007). However, these observations have been largely based on limited case studies, however.

Climate change may increase the frequency and magnitude of glacier lake outburst floods (GLOFs) and flood-related disasters. As glaciers retreat, glacier lakes are often formed, especially in locations above 4,500 meters. Subsequently, glacier lake outburst flood (GLOF) events may occur as the amounts of melt-water in these lakes increase and the moraine deposits give way. To demonstrate the increasing need for cross-border cooperation in the context of global warming, an example of upstream-downstream linkages related to potential GLOFs and hydropower stations in the Himalayan region is presented here for the Dudh-Kosi sub-basin in GBM’s Koshi Basin, 54% of whose catchment area falls in China (Tibet) and 46% in Nepal.
The Dudh Kosi sub-basin is home to about 36 valley glaciers. All these glaciers have retreated by about 10 to 74 meters per year. For example, the rate of retreat for the Imja glacier near Mt. Everest, the fastest retreating one, has increased from 41 meters per year from 1962–2001 to 74 meters per year from 2001–2006. This sub-basin contains 12 “potentially dangerous” glacier lakes, all moraine dammed, including Imja and Dig Tso. The basin has experienced GLOF events in 1977, 1985, 1998 and 2001, including the Dig Tso event. During the Dig Tso GLOF event on August 4, 1985, it caused a 10 to 15 meter high surge of water and debris to flood down the Bhote Kosi and Dudh Kosi rivers for 90 kilometers. At its peak, the discharge was 5,613 cubic meters per second, two to four times the magnitude of maximum monsoon flood levels (Shrestha, et al, 2006). The flood began in early afternoon and lasted for about six hours. Damages due to the GLOF included the complete destruction of the almost-completed hydropower project at Thame, near Namche in the Everest region, built at an estimated cost of 45 million rupees. To minimize the adverse impacts of such events, it is necessary:
(a) to monitor and assess the status of glacier lakes, (b) to install early warning systems, (c) to implement mitigation measures, and (d) to develop estimates of flow-regime changes in different catchments under various likely climate change scenarios, for developing a scientific basis for cost-effective adaptation measures (Bajracharya, Mool and Shrestha, 2007).

It is clear from Kosi Basin’s detailed GIS mapping that GLOFs in China (Tibet) and Nepal can have serious consequences for the existing and planned hydropower stations in Nepal (see Figure 1).

In the figure, the location of the cross-border potentially dangerous glacier lakes in the catchment of the Arun River, on which Upper Arun (335 MW), Arun III (402 MW), and Lower Arun (308 MW) all hydropower power stations, are being planned is noteworthy. Also, the location of such lakes in the catchment of the Dudh-Kosi River, on which a storage hydropower project (300 MW) is being planned, deserves special attention. Further to the left, Tso Rolpa glacier lake is situated in the catchment that can affect the tailrace part of the existing Khimti-Khola hydropower station (60 MW). This is also one of the cases, where mitigation measures have been carried out and early warning systems established by the government, with donor support. Further left of the Dudh-Kosi River is the Tama-Kosi River, on whose catchment several potentially dangerous glacier lakes have been identified across the border in China (Tibet). The Upper Tama-Kosi hydropower project (309 MW) is being planned in its catchment and the Nepal Electricity Authority is currently exploring sources of financing for its development. Other potential hydropower projects in the region are Tama-Kosi II and Tama-Kosi III, being surveyed by S.N. Power, a private company. These examples demonstrate that cross-border cooperation on managing GLOF risks is essential to reducing project risk, which is vital to raising funds at a reasonable cost of capital, for generating hydroelectricity in Nepal to sell in the Indian market at competitive prices.

In the literature, the economics of water resources management suggests the need to take advantage of “externalities” while planning water management: the externalities reflected in the upstream-downstream linkages, whether it is for communities, districts and provinces within national borders, or across international boundaries. Furthermore, due to the public-good characteristics of water resources, “free-rider” tendencies and opportunities for downstream nations also discourage upstream nations from taking a lead in water resources conservation and management. However, increasing concern regarding quality and quantity of water, not to speak of potential natural hazards related risk of water-
induced disasters and energy potentials, by the downstream countries and possible ‘costs’ upstream countries can impose have indicated potentials for cross-border co-operation.

Some specific areas of action to be considered for cross-border cooperation are the following:

(a) The Himalayan region is a ‘blank spot’ in the global climate map of the 4AR of the UN’s Intergovernmental Panel on Climate Change (IPCC) due to the paucity of data on hydrology and meteorology. There is a need for regional cooperation among the countries in the Himalayan region to gather and share information for assessing and monitoring climate change and its consequences for water resources management.

(b) The National Adaptation Plans of Action (NAPAs) are currently being prepared by the national governments of the Himalayan region at the initiative of the UN Framework Convention on Climate Change (UNFCCC). These NAPAs need to suggest plans of action to simultaneously work on satellite-based techniques and field-based techniques for monitoring glacier retreat as well as on the assessments of the potential impact downstream of glacier lake outburst floods.

(c) The principles of IWRM have already been accepted by scientists and policymakers alike. The concern currently is how to implement it by incorporating water governance within the framework of national governance. As the national governments of the Himalayan region make preparations to implement IWRM, it is necessary to consider cross-border cooperation for adaptation to the events occurring in the catchments that lie across the borders. For example, glacier lake outburst floods in China could affect hydro-power stations in Nepal.

3 The state of cooperation on international rivers

As discussed in the example above, the state of international cooperation on water is limited by the fact that governments tend to negotiate agreements on benefit-sharing in very specific areas of cooperation, such as hydroelectric power trade, without consideration of the holistic approach. While it is a step in the right direction for developing physical and institutional mechanisms for cooperation on water, the limitation of such a form of cooperation is that it does not clearly address the factors leading to cross-border conflicts on water, such as the declin-
ing per capita water availability due to increasing demand both in domestic and industrial sectors, depleting supply, population growth in urban centres, all exac-
erbating increasing gap between supply and demand situation.

Treaties on international rivers do not seem to reflect the concerns that the scientific or economic principles discussed above suggest. In an analysis of 145 interna-
tional treaties related to water, 39 percent of those included benefit-sharing in hydroelectricity. Only in about a third of the cases, quantum of water allocation was considered, with flood control accounting for 9 percent (UNDP, 2006).

Also, there is a preference to opt for bilateral negotiations among riparian nations, even in river basins shared by more than two countries. Out of the 263 interna-
tional river basins 106 have water institutions, of which about two-thirds have three or more riparian nations. However, less than a fifth of the accompanying agreements are multilateral, showing the preference by riparian countries for bilateral agreements even for river basins shared by more than two countries (UNDP, 2006). Furthermore, third party mediation is also discouraged, even when there are asymmetries of power of the countries involved.

Reviews of international agreements have concluded that one of the basic character-
cistics of international water law is that it is still in the formative stage of devel-
opment with regard to non-navigational uses. Despite the work of a number of scholarly institutions and the United Nations, there is still no universal treaty in force that regulates non-navigational uses and protection of international water-
courses (Salman and Uprety, 2004).

The UN Framework Convention for the Non-navigational Use of Shared Water-
courses Convention was adopted by the General Assembly on May 21, 1997, by a vote of 103 for, and three against (Burundi, China and Turkey) with 27 abstentions, and 52 non-participation in the voting. Among the core principles set forth by this framework convention, which is not obligatory, are those of: (a) equitable utilization, (b) prevention of significant harm to other states, (c) obligation to notify and inform, and (d) obligation to share data. These principles were built on the 1966 Helsinki Rules, which were the guiding principles for international treaties on watercourses for more than three decades, until the 1997 UN Frame-
work Convention was codified. Some details on these core principles, adapted from Gleick (1993), are presented here.

Equitable utilization: The principle of equitable utilization means that each basin is entitled to a reasonable and equitable share in the beneficial use of shared water. “Equitable” does not mean equal use. Rather it means that a large variety
of factors, including population, geography, availability of alternative resources, technical and financial capacity for development of the water infrastructure (i.e., resource mobilization capacity for investment) and so on, can be considered during negotiations over the allocation of water rights.

Prevention of significant harm to other states: Another principle is the obligation not to cause significant harm to other states through actions to international watercourses. This principle says that a state is responsible for preventing actions within its borders that would harm the activities or property of another state. As sometimes applied, however, this principle permits harmful actions but requires compensation or mitigation as acceptable alternatives to avoidance. But this principle is not always honoured and sometimes it is interpreted in different ways by the parties concerned and therefore needs bilateral negotiations and discussions to arrive at an acceptable situation.

Obligation to notify and inform: Both the Helsinki Rules and the UN Convention state that nations have an obligation to notify and inform other nations of any activities on shared watercourses that will affect them. Such notification permits the affected state to negotiate mitigation or to protest and, perhaps, modify or prevent the action. However, in such cases nature of bilateral relations may influence the results.

Obligation to share data: The obligation to share data is reaching widespread acceptance, but there are still several regions in the world where some basic water-resources data are considered classified and are withheld from neighbouring nations on one pretext or another.

An Example of Basinwide Cooperation on the Indus: Among the treaties on international waters signed between the countries in the Himalayan region, the Indus Waters Treaty has been successfully implemented for more than four decades, if the endurance were to be considered a test of a treaty’s success. Some discussions on the treaty are presented below. Table 6 presents a summary of the context in which the Indus treaty was signed, the contents of the treaty, and the process that led to the signing of the treaty. From the point of view of the Helsinki Rules of 1966 and the UN Framework Convention of 1997, the treaty meets the requirements of their core principles, although it was signed in 1960. No wonder the treaty has stood the test of time. (The core principles are: equitable utilization, prevention of significant harm, and the obligation to notify and inform, and the obligation to share data.) The issue then would be how to evaluate the contents of such a treaty in the changing context of climate change and its consequences for water. While the Integrated Water Resources Management
(IWRM) is an approach currently being promoted by water scientists and economists alike for managing trans-boundary water, the overriding importance of climate change as a driver of environmental change makes IWRM even more important to address flood related natural hazards and water-scarcity related concerns in a holistic manner.

Unfortunately, during the negotiations leading towards the Indus Treaty, the holistic approach of IWRM was dropped from consideration. In 1950, the Chairman of the Tennessee valley Authority published an article in Collier’s magazine suggesting that a comprehensive engineering plan for the development of a water resources management system as an integrated river system in the Indus river basin be formulated jointly by India and Pakistan. This proposal inspired the then World Bank President to propose the idea to the two countries, offering the support of the World Bank as a “neutral” third-party to resolve differences between them during the negotiations process. But this proposal to find a solution based on developing the Indus river basin along the principles and processes of IWRM, as it is known now, was not acceptable to the two countries.

Finally, the third party, the World Bank, proposed a unique solution based on the division of the waters of the six snow-fed rivers of the Indus basin. The Treaty affirms India’s territorial sovereignty over the watercourses of the three eastern rivers (the Beas, the Ravi, and the Sutlej) and that of Pakistan over those of the three western rivers (the Chenab, the Indus, and the Jhelum), subject to some exceptions in both cases. The fact that there are six rivers in the Indus river basin made this solution possible. However, this solution was far from the principles of optimal utilization of water resources and of strengthening capacity for adaptation to climate change that the principles and processes of IWRM would have made possible.
### Table 6: A Best Practice Case in a Greater Himalayan River Basin: The Indus Waters Treaty

<table>
<thead>
<tr>
<th>Context</th>
<th>Catchment area: 960,000 sq km, River systems: six snow-fed rivers, also fed by monsoon rains, Most extensive irrigation system in the world</th>
<th>Potential supply to demand balance of irrigation water favorable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Equitable and reasonable utilization</td>
<td>Treaty affirms territorial sovereignty of each state on different watercourses, three each.</td>
</tr>
<tr>
<td></td>
<td>Prevention of significant harm to other states</td>
<td>Both countries expected to refrain from any interference with the river waters except those stipulated</td>
</tr>
<tr>
<td></td>
<td>Obligation to notify and inform</td>
<td>If either party plans to construct any engineering work that would cause interference with the waters of any of the rivers, it shall notify the other party of its plans and shall supply relevant data to inform the nature, magnitude and effect of the work.</td>
</tr>
<tr>
<td></td>
<td>Obligation to share data</td>
<td>Both countries agreed to monthly exchanges of data, including those on: (a) daily discharge data on river flows at all observation sites, (b) daily withdrawals at the heads of all canals, and (c) daily extractions for or releases from reservoirs.</td>
</tr>
<tr>
<td></td>
<td>Optimal development and utilization of water resources</td>
<td>A solution based on the holistic approach to developing water resources in the basin as a single hydrological unit was dropped.</td>
</tr>
<tr>
<td>Process</td>
<td>Third party intervention</td>
<td>The World Bank got involved to resolve dispute.</td>
</tr>
<tr>
<td></td>
<td>Bilateral financial resource flows</td>
<td>India compensated Pakistan for the diversion to Indian usage of certain rivers that irrigated parts of what is now Pakistan prior to partition.</td>
</tr>
<tr>
<td></td>
<td>Dispute resolution mechanism</td>
<td>Permanent Indus Commission</td>
</tr>
</tbody>
</table>
Nevertheless, there are a number of precedents set in the Treaty that might be useful lessons for future treaties in view of the on-going environmental changes. First, the agreement in 1960 was reached by a change in the factual situation that had been the main cause of dispute prior to the agreement. In the treaty, provision was made to construct storage dams for increasing the supply of water available: the earth-fill storage dams in Mangla and Tarbela with reservoir capacity of 4.75 million acre-feet and 4.2 million acre-feet respectively. Second, there were bilateral financial resource flows between the countries in the sense that India made a fixed contribution of about 62 million pounds as compensation to Pakistan for the diversion to India of certain eastern river waters, that were irrigating parts of what became Pakistan after partition.

In addition, there were international financial resource flows as well. In order to carry out a series of works in the Pakistan side of the Indus basin, the third party, the World Bank, mobilized international financial resources for the newly created Indus Basin Development Fund. The Fund consisted of about 900 million dollars used to finance construction works in the basin in Pakistan, including the amount payable by India under the Treaty. The six major international donors were Australia, Canada, Germany, New Zealand, UK and USA, which contributed 640 million dollars, supplemented by a 80 million dollar loan from the World Bank. These initiatives are similar to the concepts of IWRM, payments for environmental services (PES), and infrastructure finance that are in practice these days.

4 Basin–wide regional economic cooperation

Cooperation at the basin level is now followed in many international river basins. Such cooperation may be in the form of: (a) coordination of activities, such as sharing information, (b) collaboration among the nations, such as developing adaptable plans, or (c) common action among the riparian countries, such as developing infrastructure facilities jointly. Nepal’s statement at the UN General Assembly Meeting in September 1998 probably sums up the interests of both the upstream and downstream nations in the Himalayan region (UN General Assembly Statement of Nepal, 1998):

“Mr. President: On our march towards a democratic and just society, we face many challenges, such as pervasive poverty, mass illiteracy, environmental degradation, population explosion and, above all, gender inequality. We believe that many problems related to economic development can be more effectively tackled through regional or
sub-regional cooperation among nations. Tremendous opportunities are available for sub-regional cooperation in our part of the world among the countries in the Ganga-Brahmaputra-Meghna basin. These opportunities include water resources development, flood control, energy supply, forestry management and environmental protection, among others. Development efforts in water resources, for example, would help irrigate the fertile fields in the plains of India, improve the waterways so vital for the transportation sector of Bangladesh, and generate hydropower in Nepal to meet the energy needs of the region as a whole. Such a development strategy may be the key to future prosperity in the region.”

The issue is how can we create an environment conducive to optimal utilization of water resources at the basin level. While IWRM is an approach currently being promoted by water scientists and economists alike, the overriding importance of climate change as a driver of environmental change makes it even more important to address disaster-reduction and water-management concerns in a holistic manner. The problem is in the implementation of such a strategy, however.

Interestingly enough, such an environment may be feasible only if we can also consider within the basket of benefits resulting from cooperation, indirect economic benefits ‘beyond water’, although water will be the natural resource of main focus. Table 7 presents a simple framework on the basket of benefits resulting from cooperation among nations in the basin. This framework has adapted the classification of the benefits into four types: political, environmental, direct economic and indirect economic benefits; all the four are defined and illustrated in Table 7 (Sadoff and Grey, 2002). The table shows how the domain of treaties may expand from those based on (a) the conventional practice of water-sharing, to (b) the optimum utilization of water resources in the basin through IWRM, and finally, to (c) regional economic cooperation through the integration of regional infrastructure, trade and markets.

The success of all these treaties, however, will depend on the strength of institutional mechanisms the riparian nations in the basin would be adopting for water governance. It appears to us that, in the changing context of regional integration for trade and investment among nations, institutional mechanisms for regional economic cooperation with a focus on water may have the highest probability of success. The Greater Mekong Sub-basin (GMS) program in the Mekong basin may be a good example of adopting an institutional mechanism towards regional integration. The basin is shared by the six nations of Cambodia, China, Laos, Myanmar, Thailand and Vietnam. Along the lines of the classification in the framework on Table 7, while there has been major disputes in the region ‘because
of the Mekong’, significant benefits have also been derived ‘from the Mekong’ through the lower basin’s cooperative management. Furthermore, sharing these benefits has not only been an important stabilizing factor in the lower basin, but it has also brought substantial benefits ‘beyond the river’, both directly and indirectly. These benefits ‘beyond the river’ include the hydroelectric power trade between Laos and Thailand, even during the periods of conflict, and of natural gas purchase by Thailand from Myanmar, creating ties that bind the countries in a web of mutual dependency (Sadoff and Grey, 2002).

Table 7: A simple framework on the benefits of cooperation

<table>
<thead>
<tr>
<th>Taxonomy of benefits</th>
<th>Definitions</th>
<th>Examples</th>
<th>Domain of treaties</th>
<th>Probability of success</th>
</tr>
</thead>
<tbody>
<tr>
<td>Political benefits</td>
<td>Reducing costs because of the river</td>
<td>Policy shift to cooperation and development away from conflicts</td>
<td>Conventional practice of water-sharing</td>
<td>Low to Medium E.g., Indus Waters Treaty</td>
</tr>
<tr>
<td>Environmental benefits</td>
<td>Increasing benefits to the river</td>
<td>Improved water quality, river flow characteristics, soil conservation, biodiversity</td>
<td>Based on the principles of Integrated Water Resources Management (IWRM)</td>
<td>Medium E.g., Mekong River Basin Agreement</td>
</tr>
<tr>
<td>Direct economic benefits</td>
<td>Increasing benefits from the river</td>
<td>Improved water resources management for drinking-water, irrigation, navigation, and hydropower; for the conservation of freshwater ecosystems; and for water-related disasters risk-management</td>
<td>Based on the principles of Integrated Water Resources Management (IWRM)</td>
<td>Medium E.g., Mekong River Basin Agreement</td>
</tr>
<tr>
<td>Indirect economic benefits</td>
<td>Increasing benefits beyond the river</td>
<td>Integration of regional infrastructure, markets and trade</td>
<td>Based on the principles of Regional Economic Cooperation</td>
<td>Medium to High E.g., Greater Mekong Sub-region Program</td>
</tr>
</tbody>
</table>
An Example of basin wide cooperation on the Mekong River: The Mekong River Basin Agreement of 1995 is an example of a treaty that emphasizes IWRM. The purpose of the Agreement is to support (a) the sustainable development and management of the Mekong River basin’s water and related resources, and (b) institutional, financial, and management issues relating to the mechanism of coordination between the member countries. Prior to the signing of the 1995 Mekong River Agreement, the MRC’s forerunner, the Interim Mekong Committee examined legal and institutional structure in other river basins (Mekong Secretariat, 1994). In particular, there was direct input from the Murray-Darling Basin Commission, the MRC’s counterpart organization in the Murray-Darling River basin, to the development of the 1995 Mekong River Basin Agreement. The final institutional structures adopted in Mekong basin contain many similarities to those of the Murray-Darling Basin, with membership, frequency of meetings, and decision-making structures of the three permanent bodies being similar.

Four of the basin countries, Cambodia, Laos, Thailand and Vietnam have cooperated in their management of the basin by establishing the Mekong River Commission (MRC), created by the 1995 Agreement on the cooperation for the sustainable development of the Mekong River Basin. The MRC consists of three permanent bodies. In addition, as outlined in the Agreement, there are National Mekong Committees in each of the participant countries which act as liaison bodies between the MRC Secretariat and the national organizations. The three permanent bodies are:

1. The Ministerial Council is the senior body made up of one member from each participating country at the Ministerial or cabinet level, who is authorized to make policy decisions on behalf of their government (MRC, 1995, Article 15).

2. The Joint Committee consists of country representatives from relevant government ministries at the Head of Department level (MRC, 1995, Article 23). It is expected to be much more active in the day-to-day running of the organization than the Council.

3. The MRC Secretariat, base in Phnom Penh in Cambodia, provides technical and administrative services to the Council and the Joint Committee, according to the direction of the Joint Committee (MRC, 1995, Article 28).

Based on the experiences in Africa and South Asia, the constraints to the management of such regional basin organizations have been identified as: (a) constrained autonomy, (b) weak institutional capacity, (c) insufficient financing, (d) the inability of the institutions to enforce agreements, (e) the lack of expertise
for technical, social and environmental analyses required to formulate regional water resource development plans, (f) the unavailability of financial resources to provide appropriate levels of support for planning studies and to manage and operate the river basin organizations, (g) the lack of institutional concentration on project implementation due to the pressure of vested interest groups as opposed to regional development planning, and (h) the limited authority vested by the national governments to the regional basin organizations to implement policies and programs within its mandate. (Gould and Zobrist, 1989; Salman and Uprety, 2002)

However, the greatest constraint often could be the non-participation of some of the important basin countries in the basin initiatives. In the case of the MRC, for instance, the absence of China and Myanmar has prevented basin-wide management. Nevertheless, these countries have joined with the MRC countries in the Greater Mekong Sub-region (GMS) program, which is envisaged from the perspective of regional economic cooperation. Such a perspective of regional economic cooperation goes beyond the focus on water alone, but would be based on water as a natural resource of central focus, around which cross-border economic exchange, primarily trade, and the development of infrastructure to facilitate it, take place.

All the six nations in the Mekong river basin, known as the Greater Mekong Sub-region (GMS) nations, have agreed to promote trade and investment in the region. The Asian Development Bank, through the GMS program, has supported regional cooperation for strengthening cross-border physical connectivity. Key activities of the GMS include development of economic corridors, focusing on road investments to improve access; institutional and policy changes for trade facilitation; and transit policy harmonization to reduce logistics costs across the sub-region. Five economic corridors have been identified and several road investments are under way in these corridors, while feasibility studies are addressing prospective railway improvements. In addition to hard infrastructure facilities, ADB has also focused on cooperation through trade and transit harmonization (Kuroda, 2006).

5 Lessons learned for cross-border cooperation

In the changing context of regional co-operation scenario brought about by climate change and economic globalization and their consequences for water stress and water-related hazards, the importance of a wise management of trans-
boundary rivers cannot be overemphasised. The international protocols and conventions as well as best practices and experiences discussed in this paper provide good models to conceptualize, design, and promote future cross border cooperation. Based on the analysis of this paper, the following policy implications and conclusions can be drawn:

1. In the context of upstream-downstream linkages, it is necessary to consider the benefits of cross-border cooperation for coping with the events occurring in the catchments that lie across the borders. (Glacier lake outburst floods in China, for instance, could affect hydropower stations in Nepal.)

2. There is a need for cross-border cooperation among the countries in the Himalayan region to gather and share information related to water-related hazards. To this end, an institutional mechanism for sharing data through a regional inter-governmental institution need to be developed.

3. The establishment of power grid networks and the proliferation of power trading companies in India have helped develop physical and institutional mechanisms necessary for cross-border trade in electricity.

4. Both bilateral and multi-lateral arrangements are in practice for cross-border cooperation depending on the geo-political situation of each region. However, there is a preference to opt for bilateral negotiations among riparian nations, even in river basins shared by more than two countries. (In the Himalayan region, for instance, there is something to learn from the bilateral model in practice between Bhutan and India.)

5. While the legal scholars continue with their fine efforts to further institutional mechanisms for cross-border cooperation in water resources, the engagement of a “neutral” third party during negotiations, the development of mechanisms for encouraging regional dialogue, and the perspective of regional economic cooperation may help to further refine the content of their works and to expedite the implementation of these mechanisms.
6 References


Karma Phuntsho & Deo Raj Gurung

Abstract

Water constitutes an indispensable resource for social, economic and environmental developments. It serves the diverse needs of different stakeholders simultaneously. Hence, an integrated approach to management of water resource is critical to sustain its use. If stakeholders do not act together with a clear mutual interest use of water resources would not be cost effective and sustainable.

Very often boundaries of catchments do not conform to the political boundaries of upstream and downstream countries. Land use changes upstream may alter the peak and the lean flows with potential negative impact on the interests of downstream stakeholders. The effluents and pollutants discharged upstream can degrade the quality of water and render it unfit for use by the downstream communities. Flood control measures installed upstream may threaten flood-dependent livelihoods downstream. The consumptive use upstream will reduce the river flows. As a result, conflicts of interest arise between the upstream and downstream stakeholders within the same country or between two countries. Hence, integrated management of water resources will require cooperation between the upstream and downstream stakeholders.

Bhutan and India have installed two mutually beneficial hydropower plants on the Wang River in Bhutan. These plants involve integration of upstream and downstream interests in the management of water resources. The two countries share the economic benefits associated with these plants. This case study delves to find out how mutually
beneficial cross-border cooperation functions between the two countries and leads to the accrual of mutually beneficial economic benefits.

Further, an attempt is made to study the watershed characteristics of the Wang River and assess its vulnerabilities to climate change. An incentive-based watershed management system that would afford mitigation and adaptation to climate change and sustain water resources for the hydropower generation in the watershed is suggested.

1 Introduction

The Wang watershed occupies a geographical area of about 4503 km² (4.5 million ha), constituting about 11% of the country’s total area. It stretches approximately from latitude 26°04'N to 28°00'N and from longitude 88°55'E to 89°52'E. The districts of Thimphu (60%), Paro (100%), Haa (50%), Chhukha (50%), Dagana (small part) and Sarpang (small) fall within the watershed (see Figures 1 & 2a).

Figure 1. Location map showing Wang watershed.
It is estimated that about 2,00,736, 29% of the country’s total population, people reside in the catchment area: about 1,11,501 are urban dwellers and 89,235 live in the rural areas. Thimphu town, which is the capital of Bhutan and with a population of 79,185 people, is located in the Wang watershed. The other urban centres are Paro town with a population of 2,932 people followed by Haa town which has over 2,495 people (see Figure 2b). Different towns in Chukha district have a total population of about 27,000 people. The watershed also supports about 95,000 livestock population of which roughly 73% constitute local cattle, 11% Yak and 16% Jersey.

The natural resources in the watershed are used for agricultural and livestock development. Forestry and mining are other economic activities. Besides timber, forest resources are used for wood energy and medicines. Some portion of the watershed is set aside as a protected area which has value for environmental conservation, ecotourism and recreation.

The Wang River has potential for generating 2740 MW of electricity. The governments of Bhutan and India have installed hydropower plants at Chukha and Tala (see Figures 2b & 4), which generate 1356MW of electricity – 336MW from Chukha plant and 1020MW from Tala plant. A balance of 1384 MW is yet to be harnessed. The power generated from the two plants constitutes 91% of the total power generated in the country. About 82% of the total power generated from these plants is exported to India. The earning from the electricity sales, both within and outside the country, contributes 12% to GDP growth. Thus the hydropower is country’s main revenue earner.
Figure 2. Map of Wang watershed showing: a. major sub-watersheds, b. settlements, c. landuse, d. geology, e. slope map, and f. digital elevation model.
2 Wang Watershed Characteristics

The landscape of the watershed is influenced by the uplift of the Himalayas due to the collision of the Indian and Asian continental plates. The High Himalaya in the north descends steeply southwards to the duars. Schist, gneiss, quartizite, phyllite, slate and limestone are the major rocktypes (see Figure 2d). The altitude of the watershed varies from 135 m to 6798 m.

The High Himalayan Region (above 4000 m) has very steep high mountains filled with snowfields, glaciers, cirques, moraines, bare rock, talus slopes and debris chutes. There are 36 glaciers and 217 moraine- and/or ice-dammed glacial lakes constituting 48.92 sq. km and 66.8 sq. km respectively in aerial coverage (Mool et al, 2001). The recent systematic survey of glacial lakes has categorized the lakes in Wang Chu basin as small and non-threatening. The Inner Valley (2000 m – 4000 m) regions consist of sections of the main N–S valleys characterized by valley floor and crests of the main ranges. The crests of the main ridge have altitudes ranging from 3500 m – 4200 m. The upper and middle slopes are steep, compound and irregular. They are often broken by rock bands, some of which are large enough to form substantial cliffs. Where the valley section is in an alluvial phase there are often downslope accumulations of deep hillwash, giving a smooth concave profile. The valley floor slopes relatively gently. Topography of the Southern Region (from 135 m up to 1500 m) is steep due to sudden rise of the landscape from the duars (see Figure 3).

Figure 3. N-S longitudinal profile of Pa Chu, from source down to India.
While the soils are not yet classified, Baille (2001) states that surface materials in the catchments encompass saprolite, river alluvium, bouldery deposits from river and gully wash, alluvial fan, mudflow, landslide debris, colluvium, solifluction, glacial materials, aeolian and compound materials. Where the surface material is fairly homogeneous and stable for long enough, mature soils with clear pedogenic horizons are formed. In the subtropical and temperate zones soils are moderately weathered and brightly coloured. Drab dark brown and wet organic soils are mixed in the mixed conifer forest. In the fir forest weak podzols and wet organic soils occur. In the alpine zone top soils are deep dark and un-weathered glacial debris are in abundance at very high altitudes. The best developed soils are on the lower hill slopes in the alluvial sections of the Inner Valleys, despite the relatively low temperatures and rainfall. The slopes in many parts of the warm and wet South are too unstable for soils to develop far before they are disturbed, and many are immature profiles in recent landslide debris.

Forest is the natural vegetation below the tree line at about 4000 m a.s.l. Because of low population density a large part of the forest cover remains intact. But forests in areas near settlements have been considerably disturbed by grazing, timber and fuelwood extraction, and the collection of non-timber forest products. The natural vegetation formations constitute alpine, temperate, sub-tropical and tropical forests. The alpine vegetation comprises of alpine grassland scattered with juniper and Rhododendron above 4000 m. Between 3200 m to 4000 m fir forest occurs with Rhododendron understorey. From 2800 m to 3500 m broad-leaved, mostly Rhododendron, and mixed conifer forests occur. Between 1800 m to 3000 m temperate broad-leaved, mainly oak and Castanopsis, and blue pine forests are prevalent. At the altitude ranging from 600 m to 2000 m subtropical and warm temperate forests occurs succeeded by tropical and subtropical broad-leaved forest between 100 m to 1000 m.

3 Land Use & Water Resource

The Wang River basin is wedge-shaped with three major tributaries which are Thimphu Chhu, Paro Chhu and Haa Chhu (see Figure 2a). Apart from these tributaries there are several independent streams running into the Wang Chhu, which is referred to as Raidak in the lower reaches. In total there are about 84 sub-catchments. The overall pattern of the surface drainage is dendritic (i.e. like the branches of a broadleaf tree, see Figure 2a). Detailed examination shows that there are many places where streams and rivers are aligned along linear geological structural features such as strikes, faults and joints, giving locally parallel
and rectangular patterns (Baille 2001). The drainage density works out to be 0.42 km/km².

The predominant land use in the Wang watershed is forest (72%), followed by protected area (2.8%), agriculture (5%), pasture land (8%), human settlement (0.3%) and other land use types comprising of 11.9%. The watershed has about 1262 km of roads with 71% of the urban road and 29% of National Highways falling in the watershed. Under forest land use only about (1%) of the forest is harvested commercially for timber resources and the rest is assigned to environmental protection. To manage the supply of water resource it is important to understand and apply knowledge about the impact of land uses on the hydrology and water yield.

In the Wang watershed the summer monsoon is the major source of rain which feeds the rivers. Generally, the rainfall decreases northward. The Southern Region receives heavy orographic rainfall with annual means 4–6 m where the diurnal rainfalls are as high as 500 mm. The winters are not completely dry along the foothills of the Southern region. Only from November to February the means of rainfall are 50 mm. The Inner Valley region (2000 m to 4000 m) receives a mean annual rainfall of over 1.5 m. An absolute monthly maximum of 620 mm and absolute daily maximum of 150 mm in Chukha have been recorded. In the High Himalaya region (above 4000 m), a station at Linhshi (4100 m) has recorded mean annual rainfall of about 700 mm. The High Himalayan Region, filled with snowfields and glaciers, is the source of perennial rivers.

Much of the area has a moisture surplus and generates average annual runoffs of at least of 1 m (Baille 2001). But moisture deficit does occur on the floors and lower slopes of the Inner Valleys, where precipitation is unable to meet the potential evapotranspiration needs of the natural vegetation or crops. Much of the drainage of the higher slopes is by subsurface throughflow. The runoff water moves downslope as diffuse and shallow lateral seepage in subsoils, surface drift materials and deep saprolite (Baille 2001). It gradually concentrates downslope and may eventually coalesce to form sub soil pipes. Springs or as marshy areas on mid- and lower slopes returns the subsurface runoff to the surface.

The mean annual runoffs for the upper two thirds of the catchment are in the range of 800–1200 mm (See Table 1, Baille 2001). This confirms that rainfalls are higher than indicated by the rain gauges on the floors of the Inner Valleys.
## Table 1: Summary of river flows and runoff for Wang Chhu

<table>
<thead>
<tr>
<th>Gauging station</th>
<th>Sub-catchment</th>
<th>Minimum monthly mean flow (cumecs) (February or March)</th>
<th>Maximum monthly mean flow (cumecs) (August)</th>
<th>Annual mean flow (cumecs)</th>
<th>Area of catchment (km²)</th>
<th>Equivalent mean annual runoff (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lungtenphu</td>
<td>Thim</td>
<td>4.6</td>
<td>67.5</td>
<td>23.6</td>
<td>663</td>
<td>1122</td>
</tr>
<tr>
<td>Paro</td>
<td>Paro</td>
<td>7.8</td>
<td>66.1</td>
<td>26.6</td>
<td>1049</td>
<td>799</td>
</tr>
<tr>
<td>Damchhuzam</td>
<td>Haa</td>
<td>2.5</td>
<td>32.0</td>
<td>10.8</td>
<td>336</td>
<td>1013</td>
</tr>
<tr>
<td>Tamchhu</td>
<td>Wang (upstream of Haa confluence)</td>
<td>14.0</td>
<td>193</td>
<td>65.7</td>
<td>2520</td>
<td>822</td>
</tr>
<tr>
<td>Chimakhoti (intake of CHEP HRT)</td>
<td>Wang (downstream of Haa confluence)</td>
<td>24.7</td>
<td>263</td>
<td>102</td>
<td>3550</td>
<td>906</td>
</tr>
</tbody>
</table>

Sources: Baille 2001

The data presented above, analyzed from the five gauging stations on the upper Wang, show that the lowest flows occur in February at the upstream stations. There are minor increases during March and April, before there is significant monsoon rainfall. The increases may be partly due to snowmelt. The increases in April over February at Tamchhu and Chimakhoti are proportionately higher, and may be partly due to pre-monsoon rainfall. The minima at the two downstream stations occur in March, but the variation in early spring is small.
In fact there are no sediment sampling stations in the Wang watersheds. However, Chukha Hydroelectricity Plant measure suspended silt at their Chimakhoti intake. Table 2 summarizes the 1995 – October 2001 data from the intake. Three particle size classes were differentiated up to May 1996, after which the >150 microns class was subdivided into >250 and 150–250 micron classes. Table 2 summarises them as aggregates.

Table 2: Mean silt loads at CHEP intake, Chimakhoti, 1995 – 2001

<table>
<thead>
<tr>
<th>Month</th>
<th>N</th>
<th>Particle size class (microns)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>&gt;150 T/day</td>
<td>75–150 T/day</td>
<td>&lt;75 T/day</td>
<td>Total T/day</td>
</tr>
<tr>
<td></td>
<td></td>
<td>% of total</td>
<td>% of total</td>
<td>% of total</td>
<td></td>
</tr>
<tr>
<td>Jan</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td>Feb</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>14</td>
</tr>
<tr>
<td>Mar</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td>Apr</td>
<td>7</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>May</td>
<td>7</td>
<td>5</td>
<td>3</td>
<td>17</td>
<td>11</td>
</tr>
<tr>
<td>Jun</td>
<td>6</td>
<td>53</td>
<td>9</td>
<td>89</td>
<td>15</td>
</tr>
<tr>
<td>Jul</td>
<td>6</td>
<td>112</td>
<td>8</td>
<td>270</td>
<td>19</td>
</tr>
<tr>
<td>Aug</td>
<td>5</td>
<td>119</td>
<td>8</td>
<td>311</td>
<td>18</td>
</tr>
<tr>
<td>Sep</td>
<td>7</td>
<td>57</td>
<td>8</td>
<td>155</td>
<td>22</td>
</tr>
<tr>
<td>Oct</td>
<td>7</td>
<td>20</td>
<td>5</td>
<td>69</td>
<td>17</td>
</tr>
<tr>
<td>Nov</td>
<td>6</td>
<td>2</td>
<td>2</td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td>Dec</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Daily mean</td>
<td>–</td>
<td>32</td>
<td>7</td>
<td>78</td>
<td>18</td>
</tr>
<tr>
<td>Year total (MT/yr)</td>
<td>–</td>
<td>12 000</td>
<td>28 000</td>
<td>120 000</td>
<td>160 000</td>
</tr>
</tbody>
</table>

Source: Baillie 2001
The data confirm that virtually all erosion takes place during and just after the monsoon, with the five months June – October accounting for over 92% of the annual total. The sediments become increasingly coarse during the high and turbulent flows of the monsoon. During periods of low flow, the very low sediment loads are fine grained, restricted to the clay, silt and the very finest sand fractions.

The annual totals can be expressed as a loss per unit area from the upstream catchment. From the above information Ballie (2001) estimated that total soil loss for all size classes is equivalent to about 45 T/km²/year. Values are generally low for large catchments, but the Chimakhoti loads are still low by international standards. It confirms that the Wang Chhu water is of high quality for hydro-electricity generation.

Ballie (2001) cautions that the data require to be analyzed further to reveal more insights. The data are only for suspended load, measured once daily from a single depth. They do not include either the small but environmentally important loads of leached nutrients, soluble weathering products, etc. in solution, or the spasmodic but large and important movements of material as stones and boulders along the riverbed. Because they aggregate the suspended loads derived from a large area, the data blur the effects of locally important events, such as landslides. Individual events only register strongly if they occur close to Chimakhoti.

4 Hydropower and Benefit Sharing

The Government’s 2006 Revenue Report reflects that in 2006 the Chukha Hydroelectricity Plant earned Nu.2092.862 million. The tariff rate paid by the Government of India was Nu.2/unit of energy. It turns out that the Plant generated about 1046 million units of energy. The draft Power Policy for Bhutan presented in 2005 estimates that the Tala Hydroelectricity Plant would produce around 4865 million units of energy. Assuming that the tariff rate is Nu.2/unit, it would earn annual revenue of Nu.9730 million. The total annual earning from the two Plants, paid by the government of India, would amount to Nu.11,822.86 million.

To assess the benefit to the Government India, the tariff rate of Rs.4.30 per unit of electricity in West Bengal, where the electricity from the two Plants is sold, can be used. Simply multiplying the total of power sold from the two Plants it turns out that the Government of India earns Rs.25,419.12 million. The mark up is about 214% over the amount paid to Bhutan. However, the figure may be taken with a caveat since Tala is supposed to have higher tariff rate.
5 Climate Change and the Wang Watershed Vulnerability

Human activities alter natural ecosystems by exerting increasing demand for food, fresh water, energy and other resources (Galloway et al. 2003). Activities such as clearing forests, practicing subsistence agriculture, expanding and intensifying farmland, or expanding urban centers are having large impacts on ecosystems (Foley et al. 2005). For Wang watershed it is inevitable that population of both human and livestock will increase. As a result, the demand on the land and water resources will increase. More forest will be harvested, agriculture and horticulture would expand, livestock grazing would intensify, mining would expand, urban centers would increase in number and expand in areas, road networks would increase, new species may be introduced, etc. These activities will alter the natural ecosystems in the watershed and potentially increase negative impacts of climate change.

Figure 4. Tala dam along Wang Chu, one of the two dams constructed as a joint initiative between India and Bhutan.
The National Adaptation Plan of Action for Bhutan envisages the climate change to entail a host of vulnerabilities to the population dwelling in the watershed. The recurrence of drought combined with lightening will make forest vulnerable to forest fires. Phenological characteristics of plants would change and the endemic species would face the risk of reduction. The alpine rangelands would experience drought and decline in productivity. Vector-borne diseases may take toll on the wildlife due to global warming. Degradation of forest ecosystem and declining productivity of alpine rangeland would cause transboundary migration of wildlife.

Agriculturally, unpredictable weather pattern would decrease agricultural productivity. The extant crops would face the risk of extinction due to change in temperature and moisture regime wrought by climate change. Loss of soil nutrients due to accelerated decomposition due to global warming would affect agricultural productivity. The loss of crop to hailstorm destruction would increase as the frequency of hailstorm would increase due to climate change. The freakish pattern of frost, occurring in early autumn and late spring would bring down the quantum of paddy and potato harvests. The warming associated with climate change will escalate the crop loss incurred by the crop pests and diseases. The livelihood of farmers would be affected due to decline in agricultural production. The decreased production and increased damage to infrastructure would affect food security of the country.

The temporal and spatial variation of rainfall would affect the flow of water in the watershed. Due to warming the water loss through evapotranspiration in the watershed would increase. The runoff in the basin would reduce. The glaciers that feed the headwaters would recede and the lean season flow would dwindle further. The competition for water resource would increase among the water users would increase as the economic activities expand corresponding to the population growth. The amount of water for hydropower generation would decrease bringing down the earning from hydropower trading. With the escalation in the use of forest and pasture resources, expansion of agriculture, infrastructure building, and urbanization, rivers would face the risk of increased sedimentation posing the risk of making hydropower generation less cost-effective since the maintenance cost will shoot up correspondingly. The specific temperature of water will likely rise and modify the aquatic ecosystem. The pollution of rivers from fertilizers and pesticides used and other non-point pollutants will probably increase.

The impact on the human health will grow as the potential for natural disaster associated with climate change such as flash flood, landslides, glacial lake out-
bursts (GLOF), etc. would increase. The polluted drinking water and emergence of new vector-borne diseases would take toll on human life more than in the past.

6 Watershed Management: A Strategy to Reduce Vulnerability

A watershed usually provides a host of goods and services. Watershed management organizes rational use of land and other resources on the watershed to sustain those goods and services without affecting soil and water resources adversely. The inter-relationships among land use, soil and water, and the linkages between uplands and downstream areas underline the concept of integrated watershed management.

Hydrologic phenomena are extremely complex, and may never be fully understood (Chow et al. 1988). The hydrologic cycle manifests as (i) the atmospheric water system, (ii) the surface water system, and (iii) the subsurface water system. The atmospheric water system contains the processes of precipitation, evaporation, interception and transpiration. The surface water system includes overland flow, surface runoff, subsurface and groundwater outflow, and runoff to streams and the ocean. The subsurface water system encompasses the process of infiltration, groundwater recharge, subsurface flow and groundwater flow.

Black (1970) recognizes that three principles are critical to watershed management. One, watershed management has to treat the natural ecology on the watershed as a dynamic and balanced system. Two, the watershed management has to deal with the factors affecting runoff. And three, the watershed management has to intervene with the imbalance in distribution of water in the terrestrial hydrosphere.

Generally, on large watersheds, watershed reaction and stream behavior are largely influenced by the factors over which human beings have no control or very little control. Regional climatic and broad-scale weather patterns dominate stream behavior. Annual stream yields and seasonal stream yields, flood frequencies, minimum flows, length of shortest half-flows, quarter-flow intervals, etc. are influenced by regional climatic patterns. On smaller units of the larger watersheds soil and vegetation factors influence retention and detention storage, vegetative density and depression storage, infiltration rates and evapotranspiration. Runoff is influenced by differences in soil depth, texture and structure and the type of vegetation. The human beings influence the hydrology of the smaller watersheds through the use of land and other natural resources.
The natural ecology on the watershed is shaped by a number of interacting and counteracting forces (Black & Leonard 1968). Depending on the nature and period of these forces, underlying rock, and geologic history, and the climate the watershed develops the soil and vegetative condition. On the other hand, atmospheric-climatic factors, geologic-geomorphic factors, soil-vegetation factors and run-off-channel factors determine the runoff characteristics of the watershed.

Black (1991) states that one third of one percent of the world’s fresh water falls as annual precipitation. One percent of annual precipitation, flowing as stemflow, makes up a much greater percentage of the water reaching the water table. The amount of water passing through a tree due to transpiration is thousand times more than the water necessary for growth. A large percentage of the annual runoff occurs during a small percentage of the year.

In Wang watershed the natural resources are used for multiple goods and services by multiple downstream and upstream public and private sector stakeholders. The goods and services include forest products, pasture resources, agriculture, ecotourism, mining, and environmental services. It provides land for urban and rural human settlements and infrastructure development. Water for human beings, livestock, agriculture, forest and pasture vegetations, industries and hydropower comes from the watershed as well. The hydropower serves a host of industries in Bhutan and India, while ecotourism and conservation cater ecosystem and economic services to global communities. All these have impacts on the natural ecology of the watershed and the factors affecting the runoff.

Rationally, cost-benefit analysis of multiple uses of watershed resources would lend insights into which of the uses provides the maximum economic return. If the one that provides the maximum economic return can guarantee sustainable economic alternatives to the ones that have low returns then that particular use can be pursued solely. In other words, let us say that the earning from hydropower can sustain an appropriate compensation for those living off the agriculture, industries, and forestry. These occupations can be stopped. An alternative economic arrangement, such as ecotourism which less consumptive in terms of use water and natural resources, can be pursued. The goods provided by those occupations can be procured from the market out of the compensation distributed out of the hydropower earning. The water used by them can be used for increasing hydropower generation. If this is infeasible, then, multiple uses of water resources and other watershed resources become necessary.

The multiple uses of the watershed resources impacts on the sustainability of land and water resources. To sustain those goods and services the use of land
and water resources has to be sustainable. As much as fertile soil is required to sustain economic activities in the watershed ensuring water in adequate quantity and quality would be indispensable. For this, the application of knowledge about how the use of watershed resources impacts on the land and water resources is indispensable.

To gain some insight into how water could be managed it is important to look at the water balance equation, whereby:

\[ P = Q + G + E + S \]

P is precipitation, Q is surface run-off, G is ground water outflow, E is the evaporation and S is the change in storage. The precipitation is the determining factor as to how much water an area can have. The quantity of water available in an area is sum of Q and G. Any change to the quantity can be achieved only by changes to evaporation (E) and storage (S). Both evaporation and storage can be changed by manipulating vegetative cover. However, vegetation has environmental values to the quality of water. So, its manipulation will require avoiding the environmental implications which can entail enormous economic and social costs.

Researches have confirmed that harvesting forest reduces transpiration and interception loss leading to increase in the average surface runoff and water yield. It also minimizes time of concentration of flow and increases the peak flows for a given precipitation event. The frequency and intensity of extreme flows also increases as the vegetation is removed. In the higher altitude reduction in forest cover increases the size of snow packs leading to increase in water yield in summer and spring as the temperature increases.

Riparian transpiration can lower the water table and potentially dry up small streams. The lean flow can increase with the removal of forest from the riparian area (Hubbar, 2006). In some case, the lean flow has increased with the increase in forest cover (Amatya, 2004).

Generally, undisturbed forests produce stream of high quality. Surface erosion, channel erosion and mass wasting degrades water quality downstream, destabilizes channels, reduces reservoir storage capacity, destroys fresh water fauna and renders forest land unproductive (Douglass & Swank, 1975; Sopper, 1975; O’Loughlin et al., 1980; Swanson, 1981; Burgess, 1973). Under intact forest covers, erosion rates are lower than alternative covers such as pastures. The erosion rate rarely exceeds 0.04t/ha/yr in the undisturbed forest (Kenneth et al., 1991). As the forest cover is removed rains dislodge soil from the ground and sediments and pollutants pollute the water.
Forestry operations include road construction and logging operation which compact soils. The compacted soils reduce infiltration rates and increases surface runoff loaded with sediments. Following logging the greatest water yield is observed during the late spring to early autumn months (Hubbar, 2006). However, the removal of forest cover exposes soil and causes high surface erosion. The forest logging operations and road construction associated with it results in erosion with the rate often exceeding 15 t/ha/yr (Kenneth et al., 1991). Road construction sites experience erosion with the rate exceeding 95 t/ha/yr (Kenneth et al. 1991). Also, the road construction and urbanization entail removal of forest. While the water yield increases the quality of water is degraded through erosion and discharge of pollutants. Excessive use of rangeland and grazing areas also increases runoff through reduction of infiltration due to soil compaction besides its impact associated with removal vegetation. Overgrazed rangelands can generate sediments during the rain and sedimentation degrades water quality.

The water yield in a watershed is influenced by several other factors besides vegetation. The size of the watershed determines lag time to peak flow. The larger the area of watershed the longer it takes for the peak flow. The steeper the slope the quicker the peak discharge. The potential for mass movement increases with increasing slope angle and height especially in combination with weak and susceptible soil and rock lithologies, weathering and alteration, high water contents, high seismicity and rapid rates of deformation (Hancox, 1974; Read 1974 1974; Campbell, 1975; Kojan & Hutshinson, 1978).

The watershed provides multiple uses to diverse stakeholders. Achieving the multiple use objectives poses serious management challenge. Since the water and land have to be managed sustainably an integrated management system is indispensable for the management of the watershed. A clear land use policy should direct the integrated water and land resource management. A management framework to mobilize the efforts of different land users to sustainably manage water should be formulated and adopted. Institutions mandated to co-ordinate, implement, monitor, and evaluate the integrated land and water resources have to be established. The water resource has to be allocated, in order of priority, to all stakeholders. Water has to be treated as an economic good and efficient use has to be institutionalized. Demand and supply have to be managed through an appropriate pricing policy.
Watersheds are a part of the larger terrestrial ecosystems which provide ecosystem or environmental services. The environmental services provided by watersheds are often termed as watershed services. The watershed services are environmental services provided by a watershed that produce benefits to downstream, usually in the form water quality or water quantity (Agarwal et al. 2007). These services include flood mitigation through regulation of water flow, reduced siltation, good water quality. These services are influenced by the watershed users through land and natural resource uses.

The sediment load of the Wang River, estimated at \(45\ T/km^2\), is very low by any standard. It is clear that maintenance cost of the reservoir and the equipment ought to be low at Chukah and Tala Hydropower Plants will be low. The quality of water flowing to India is good and the flow is well regulated. However, as the upstream population grows demand on the water for human and livestock consumption, agriculture and industries will escalate. The pressure on the forest and pasture resources and protected areas will grow. Agricultural expansion, urbanization, and infrastructure development will reduce forest cover. All these changes will have implication on water resource.

Assuming that the present level of precipitation remains unchanged the quantity of water available for human use may increase because of decrease in forest cover and urbanization. And the cost of maintaining the reservoir and the equipment will increase as removal of vegetation degrades the quality of watershed service. The flow of water will be affected and the sediment load will increase. As the quality of the water degrades the maintenance cost of the hydropower plants will escalate. The degraded water quality and the changing water courses will impact the downstream population in India negatively.

Generally, ensuring the sustained supply of quality water from the watershed will call for investment in the watersheds. The investments have to secure an improved livelihood to the upstream dwellers as well as secure development and conservation of the watershed resources. Conservation farming, nature conservation, afforestation, and environmentally compatible timber harvesting has intrinsic value to water resources. This value translates to sustained supply of quality water to the hydropower plants and downstream population.

Market-based mechanisms are now evolving to compensate for environmental services in general. Trading of carbon sequestration offsets is a case in point. The
same mechanism can be extended to pay for the watershed services. The watershed service givers and recipients can be identified. In the case of the Wang watershed the two hydropower plants could become the watershed service recipient and the upstream farming population the service provider. The watershed services can be identified and the extent of contribution made by each farmer could be estimated. The total service cost can be factored into the cost of unit cost electricity traded between the two countries. Trading electricity based on the market price would link enroll the consumers downstream to contributing and ensuring the required water resources to hydropower plants in which they have an economic benefit. The benefits shared more equitably between the downstream and upstream stakeholders can assure more trusted and sustainable cross-border co-operation.

8 References


4.3 Water Resources as the Source of Cooperation for Tajikistan, Afghanistan and PR China (Xinjiang)

Anatoly P. Kholmatov¹

1 Background

Geographically, Tajikistan is situated in the South-East of Central Asia. Tajikistan is a landlocked country spread over an area of 143,1 square kilometers. Tajikistan has its frontiers with four countries. To the south, it borders with Afghanistan (1030 km of land); to the east, with China through the Xinjiang-Uighur autonomous province (430 km); in the North with Kyrgyzstan (630 km), and in the North and West with Uzbekistan (910 km).

Tajikistan is a mountainous country that ranges in altitude from 330 to 7,495 meters above sea level. More than a half of Tajikistan’s landscape lies above the altitude of 3,000 meters above sea level. 93% of the territory comprises on mountains. One third of the land has foothills and prairies. Lowlands mostly lie within river-valleys.

The climate of Tajikistan is continental; and the average number of sunny hours per annum is from 2,097–3,166. The average amount of solar radiation per annum is from 151,1–176,1 kilocalories per square centimeter; and when the sky is clean, it reaches from 182,9–2,231 kilocalories per square centimeter. The average annual air temperature in the valleys and foothills is +6 +17° Celsius; and in the Pamiri highlands, it is close to 0° Celsius. The absolute minimal temperature was recorded in Bulunkul, Eastern Pamirs (-63° Celsius), and the absolute maximum (+48° Celsius) in Shakhritous, in the Southern part of the country, close to the Afghan border. In most of the country regions, 65% of precipitation (rain and snow) fall out during cold seasons. The average annual amount of precipitation is 760 millimeters.

Afghanistan is also a mountainous landlocked country with the territory of 647,5 thousand square kilometers. It borders with China (Xinjiang) to the east; with

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Tajikistan to the northeast; Uzbekistan and Turkmenistan to north and north-west; with Iran in the west; and Pakistan in the south. The biggest part of the Afghan-Tajik borderline (921 kilometers) lies along the rivers Panj and Amu Daria (Oxus River) in the Pamirs, and along the Lake Zorkul. Afghanistan and Tajikistan have bridge connections along the River Panj in Ishkashim, in vicinity of the Tajik city of Khorugh, and in the area of Nyzhny Panj.

In terms of joint use of water, Afghanistan and Tajikistan are mostly interested in their water resources in the provinces Takhor, Badakhshan and Qunduz that are situated on the Amu Daria basin (and the water used by both countries). The Amu River also feed the Aral Sea (the area is also shared by Uzbekistan, Turkmenistan and Iran).

There is no trans-border river between Afghanistan and China. Therefore, in the perspective, cooperation between the two countries would be feasible in the areas of joint-studies of ground waters, glaciers, snows, atmospheric processes, and climate change— as territories for such studies lie in the mountain systems of the Pamirs, Hindu Kush and Karakoram.

Xinjiang-Uighur Autonomous Region of China is separated from Tajikistan by the the Sarykul (also written as Sariqol) range. The territory of this region is 1,6 million square kilometers. The city of Urumchi is the administrative center of the Autonomous Region. Tajikistan and China share the trans-border River Markansu within the Tarim river basin, which is the biggest water area in Western China. Tarim feeds the Kashghar valley surrounded by the mountains of Tien Shan, Pamirs, Kunlun Shan and Altyntag. The valley occupies an area of 530 thousand square kilometers. The Yarkend, Kashghar and Khotan oasises are fed by the waters from the Tarima River-basin.

2 Water resources

Water resources of Tajikistan include glaciers, ground and surface waters (rivers and lakes). There are 14,509 glaciers in Tajikistan, which cover 11,146 square kilometers (about 8% of the country’s territory). The biggest glaciers are Fedchenko (651.7 sq km ), Gharho (146 sq km), and Grum-Grzhmailo (143 sq km). Tajikistan’s glaciers contain 845 cubic kilometers of ice, which is 13 times bigger than the annual river stock of the whole country, and 7 times bigger than the annual river stock of all rivers of the Aral Sea river basin. The average mass of ice (85%) in most of the glaciers is more than 1 square kilometer; and the share of ice in these glaciers constitutes 20% of the total volume of ice in the country.
Thus, the small glaciers are very important for Tajikistan’s environment and economy. However, these glaciers are prone to the global climate change and the impact of the Aral Sea shrinkage.

It is noteworthy that 64 cubic kilometers of the river stock in Central Asia are formed on the territory of Tajikistan, which is 55.4% of the mean annual stock of the Aral Sea basin. Tajikistan forms 62.9 cubic kilometers of water resources within the Amu Darya (river) basin (the basin connecting Tajikistan and Afghanistan), which is 80% of the total water resources in this basin.

In addition, there are about 1,300 lakes in Tajikistan with the total area of 705 square kilometers. Most of the lakes are concentrated in the Pamiri-Alay mountains within the altitude of 3,500–500 above sea level. These lakes contain 46.3 cubic kilometers of water, 20 cubic kilometers of which are fresh waters. In view of the inaccessibility, there have been significant gaps in the studies of these lakes. More cooperation and logistical support are needed for studies and research of these lakes.

Tajikistan has nine infrastructural water reservoirs with the total volume of 15,344 cubic kilometers of water, out of which 10,74 cubic kilometers are within the Amu Darya basin. The Nurek hydro-power plant with its water reservoir for seasonal run-off control contains 10.5 cubic kilometers of water and presents major interest in terms of irrigation and power supply in Tajikistan, Afghanistan and other neighboring countries. Currently, Tajikistan exports electricity through the existing power supply lines to the neighboring areas of Afghanistan. At present, only 13% of Panj and Amu Darya run-offs are under control within the areas of Tajikistan and Afghanistan. The main rivers of Tajikistan connected to the Aral Sea basin are Vakhsh (average annual stock is 20.3 cubic kilometers), Kafirnikhon (5.62 cubic kilometers), and Zerafshan (5.5 cubic kilometers). These run-offs are not completely controlled, which are nice potential sites for hydro-power plants and water reservoirs guaranteeing stable power and water supply in the future, especially in arid seasons in the conditions of global climate change.

The river Panj bordering in Afghanistan has more than ten cross sections (potential dam sites) for hydro-power plants and water reservoirs with the total volume of 36.1 cubic kilometers, which could serve to infrastructural and economic interests of Tajikistan, Afghanistan and other neighboring countries. These issues along with the potential construction of the Dastijum hydro-power plant with the capacity of 4.5 million KW and a water reservoir with the volume of 17.4 billion cubic meters, are under discussion between the two countries.
The Tajik Lake, Sarez, in the Pamiri mountains, which contains 17 cubic kilometers of pure water, has a very big potential for the countries of the Aral Sea basin. The Lake’s natural dam (also known as the Usoi dam) poses a big threat to the whole region. The potential blow-out of the Usoi dam threatens to inundate 52 thousand square kilometers of territory populated by six million people in Afghanistan, Tajikistan, Uzbekistan and Turkmenistan.

Emomali Rahmon, President of the Republic of Tajikistan and President of the International Fund for Saving the Aral Sea (IFAS) in his appeal to the Parliament of Tajikistan in 2007, stressed for the necessity of adopting a joint resolution on the “Lake Sarez” threat in order to protect the territories, the economies of the countries, and to resolve the water problems in Central Asia.

The overall ground water resources in Tajikistan amount to 18.7 cubic kilometers per annum, out of which 21.8% of these resources are located in Khatlon Province, and 21.4% in Gorno-Badakhshan Autonomous Province (the latter borders with Afghanistan).

It is difficult to estimate precisely Afghanistan’s water input in Amu Darya basin, since no essential studies have been conducted over the last several decades.

In 1967, the Soviet “SredAzHydroVodKhlopok” (Central Asia Hydro Cotton) Research Institute designed the “Scheme for Irrigation in the Northern Areas of Afghanistan”, which so far has been the only integrated scientific study on water resources and irrigation in Afghanistan.

According to this study, the rivers Khulm, Balkh, Safed and Kaisar annually irrigate on the average 10 thousand hectares of arable land, i.e. 35 million cubic meters of water from these rivers are used for irrigation purposes. The river Kunduz annually produces on the average 3.48 cubic kilometers of water; and other rivers in Northern Afghanistan produce 2.01 cubic kilometers of water per annum. According to the experts’ estimates, the rivers of Afghanistan connecting the Aral Sea basin form annually 16.3 cubic kilometers of water.

The river Markansou taking its rise in Tajikistan flows into the Tarim river basin in China.

The river Tarim is formed by the river Yarkend (1,068 kilometers in length and the average water discharge of 170 cubic meters per second), and the river Khotan (1,035 kilometers and 120 cubic meters per second of water discharge). The common length of the rivers Tarim and Yarkend is 2,030 kilometers; the water basin area is about 1 million square kilometers; the average water discharge is 167 cubic
meters per second. At present, the water stock of Markansou river (having its rise in Tajikistan) in the volume of 1.2 cubic kilometers per year serves the Chinese irrigation and hydro-energy purposes. In view of the high altitude (more than 4 thousand meters above sea level), Tajikistan does not use this river’s hydro potential for irrigation purposes.

In the perspective, it is quite possible to use this river’s water for meadow formation (currently, the pastures are fed by natural precipitation). The grass-landing (as a type of irrigation) could be very efficient for the increase of natural herbs production. However, such activities are currently quite problematic, and could become realistic only in remote perspective.

3 Use of water resources

The water use and management in Tajikistan are based upon short-term (annual) and long-term (10 years and more) economic forecasts. The actual water supply intake in Tajikistan is 12.8 cubic kilometers per annum, i.e. 20% of the overall volume of both ground and surface waters, which is an equivalent of the 11% of the mean annual stock of the Aral Sea basin. Within this basin, Tajikistan has a water supply intake quota in the volume of 14.29 cubic kilometers (10.7% of the total volume). Within the water consumption infrastructure, the biggest share is used for irrigation – 84%; while drinking water constitutes 8.5%; industry – 4.5%; and fish farming – 3%.

Due to abundant hydro resources (527 billion KW/hour per annum, 4% of the global resources), which have been reclaimed only by 5%, the main consumer of water resources is the Tajikistan’s hydro energy sector. According to the Water Concept approved by the government of Tajikistan in 2001, in the perspective, water consumption in the country will reach the level of 19–22 cubic kilometers per year, taking into consideration the forthcoming reclamation of available arable lands, which will expand up to 1.6 million hectares in order to resolve the food security problem. These tasks will be implemented along with the design of new approaches to water division in Central Asia.

The main consumer of water resources in Afghanistan is its irrigated agriculture, which is based upon the stocks of the rivers: Panj, Kukcha, Kunduz, Balkh, Safed, Shirintagao and Amu Dayia. According to the data from studies conducted in 1984, the rivers mentioned above previously irrigated up to 400 thousand hectares of arable lands. The share of industry in water consumption is not big, since the country industry is based mainly upon the agricultural processing. It
constitutes only 1–2% of the overall water supply intake, which is in total 549 cubic kilometers per annum. The reserve on non-reclaimed arable lands within the basin of Amu Darya in Afghanistan is 1.5 million hectares. In the nearest future, Afghanistan has an intention to reclaim not less than one million hectares of new irrigated lands.

Agriculture is the main consumer of water resources in Xinjiang-Uyghur Autonomous Region of China. On an average, the basin of Tarim River forms annually 14.8 cubic kilometers of water. Within the Tarim river valley, these resources are used quite frugally (on the average, 3.5–4.0 thousand cubic meters per hectare). The total flatland area is 530 thousand square kilometers. The main constraining factor for the development of irrigation within the Tarim River basin is lack of water resources and absence of an economically justified water diversion.

4 Potential conflicts related to water resources, negotiations, and trends of cooperation

Tajikistan, Afghanistan and China maintain friendly relations together. Tajikistan does not have any territorial disputes with China and Afghanistan. Tajikistan and China have road communication (the mountain pass Kulma in the Pamirs), and air communication; the railroad communication is maintained via the territories of Uzbekistan, Kazakhstan and Russia. No conflicts have been caused by water resource management. No official agreements concerning the river Markansou and its division exist between the two countries. In this perspective, it is envisaged to form grasslands on the territory of the Eastern Pamirs (400 thousand hectares are available) using the waters of this river. Thus, the necessity of negotiations between Tajikistan and China on the issues of joint use of Markansou River can emerge only in remote perspective. Afghanistan and Tajikistan have three automobile bridges over the river Panj in Ishkashim, Khorugh and Nyzhny Panj.

The Amu Darya basin is shared by Tajikistan, Afghanistan, Uzbekistan, Turkmenistan and Iran. Tajikistan has official agreements with Uzbekistan and Turkmenistan on the division of the Amu Darya waters. These provisions are closely related to those concerning the division of Syr Darya waters (the agreement was concluded among Tajikistan, Kazakhstan, Kyrgyz Republic and Uzbekistan). At present, under the auspices of the Asian Development Bank (RETA Project), experts of the countries mentioned above conduct negotiations on a new water resource division in Central Asia. Regrettably, Afghanistan does not participate
in the negotiations. In 2003–2005, Afghanistan displayed interest in the accession to IFAS.

Afghanistan had been provided with the relevant accession protocols. However, so far, this process has been dormant. As for the Amu Darya basin, Tajikistan and Afghanistan do not have any disputes on the water division issues.

Taking into consideration the current situation, i.e. the need to establish formal relations with Afghanistan in terms of water division, it would be feasible to organize an international summit under the auspices of IFAS involving all the countries of the basin to discuss a possibility of launching a regional project, in which Afghanistan would be a full-fledged partner.

So far, the water division in Central Asia has been based upon the outdated Soviet documents, approved by the Nukus Declaration of the Central Asian Countries and International Organizations (1995), which Afghanistan is not the member of.

Tajikistan is a member of the IFAS (again, Afghanistan is not the member of the Fund). Currently, the water use division in Central Asia is being maintained without Afghanistan.

The most essential point of potential conflict in the joint use of water resources in Central Asia is the absence of an economic mechanism for fair water use and management, and unequal quotas on water (legacy of the Soviet epoch).

However, in the Soviet times, the countries of the region shared the energy resources (natural gas, coal, oil products, etc.) fairly, and jointly enjoyed the benefits of social protection.

The current situation is not in favor of Tajikistan and its national interests. Tajikistan participated in the initiative of establishing the Water and Energy Consortium in Central Asia. This initiative launched and actively discussed in 2003-2004 was meant for plastering the cracks in water use and management: however, the work is still pending.

There is an agreement between Tajikistan and Afghanistan on cooperation in the sphere of hydro-energy, reclamation of Panj River, and construction of a power supply line.

Tajikistan and Afghanistan have been holding negotiations on the construction of Dastijum hydro power plant with the designed capacity of 4.5 million KW/hour and a water reservoir with the volume of 17.4 cubic kilometers. An agreement on the construction of a power supply line of 500 KW [Tajikistan –
Afghanistan (Puli Kumri – Kabul) – Pakistan (Peshavar) has been reached in order to ensure annual provision of energy in the amount of 8.6 billion KW/hour to Tajikistan’s neighbors. Estimated cost of the power supply line is up to Kabul is $159.3 million.

Tajikistan and Afghanistan also conduct joint bank reinforcement and flood protection works on the River Panj in Khamadoni district, Khatlon province.

Another regional problem for Tajikistan and Afghanistan is a probable outbreak of Lake Shiva in the province of Badakhshan, Afghanistan. The lake poses threat not only to Tajikistan and Afghanistan, but also to Uzbekistan and Turkmenistan, potentially causing casualties and mass economic losses. International support and cooperation are needed in tackling this problem.

Tajikistan and China have signed a Memorandum and a Protocol on cooperation in hydro-energy reclamation of the river Zerafshan, and the joint construction of six hydropower plants along this river. Within the framework of the trade-economic cooperation, China has been providing Tajikistan with pumping equipment and spare parts, cables and excavators for construction works.

Tajikistan has a significant capacity in terms of assistance to Afghanistan in rehabilitation and further development of its water sector.

Tajikistan can help its neighbor in the following realm:
– Training of specialists in irrigation, energy and construction in higher educational and scientific-research institutions of Tajikistan, in the Tajik Agricultural Academy, in the Institute of Hydro Technology and Irrigation;
– Design of projects and cost estimates;
– Use of the domestic industrial base to manufacture pipes, flumes, concrete products, and maintenance of excavators;
– Utilization of the powerful human and construction potential.

Tajikistan can also help its neighbor in organizing a joint hydrological monitoring on the river Panj and on the internal Afghan rivers (Wakhan, Kukcha, Kunduz, etc.), which would ensure a realistic study of the water resources of the country, and to prevent conflicts.

It would be feasible to launch a regional project involving Tajikistan, Afghanistan and China (Xinjiang Region) to study atmospheric processes, glaciers and water stock formation, which would strengthen the regional cooperation and serve the interests of mutual sustainable cooperation.
While considering the projects targeted to rehabilitation of Afghanistan’s water sector, the international donor agencies should pay specific attention to these factors.

The International Decade “Water for Life” 2010–2015 proclaimed by the UN General Assembly following Tajikistan’s proposal, opens new perspectives for international cooperation.

From 30 May to 1 June 2005, Dushanbe hosted the International Water Forum, which followed the UN General Assembly resolution. Participants of the Forum discussed perspectives of regional cooperation within the basins of trans-border Rivers. More than 50 countries, 103 international and 15 basin-country organizations took part in the Forum. Among them were representatives of China and Afghanistan.

Asia-Pacific Water Forum established on 21 March 2006 at the IV International Water Forum in Mexico, also opened wide opportunities for cooperation. According to the Forum Concept, the Central Asian sub-region include Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan, Azerbaijan, Arenia, Georgia and Afghanistan. The Forum developed priority tasks for the member countries concerning the issues of funding, disaster management, and ecology. Presentation of this document will take place at the First Summit of the Forum Countries in Beppu, Hapan on 3–4 December 2007. Leaders of 49 countries of the Asia-Pacific region were invited to the Summit. Regrettably, Afghanistan did not participate in the preparatory work. It would be feasible to integrate Afghanistan in the Forum activities.
5 Resources and Literature


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4.4 Regional Cooperation through Development of Conservation Corridors in the Kangchenjunga Landscape

Nakul Chettri, Bandana Shakya and Eklabya Sharma

1 Introduction

The Hindu Kush-Himalaya (HKH) region, with an area of 4.3 million square kilometres (sq km), is a home to 150 million peoples. It sustains a total population of 1.5 billion living along the associated river basins. The biological significance of this region is evident from the fact that it hosts 2 of the 10 mega-biodiversity centres of the world (Mittermeier et al. 1997) and 4 of the 34 biodiversity hotspots (ibid, 2004). Moreover, 39% of the HKH region has been reserved as ‘protected areas’ (PAs) that focus on the conservation of important biodiversity and ecological habitats therein (Chettri et al. 2007). Although the designated PAs and area under them have increased, many of them have not been able to translate their conservation intentions into the ground realities. In addition, PAs are being managed as isolated ‘conservation islands’ without corridors or any form of habitat connectivity that could provide continuous landscape for the movement of animals, dispersal for plants and for genetic transfer necessary for the long-term survival of the species (Chettri et al 2007). It is further evident that wilderness found in the rich transboundary areas shared by two or more nation states are subjected to higher level of conservation threats, mainly through over extraction of resources, illegal trade and poaching, limited livelihood options for the communities and inadequate policy measure or policy differences among the countries. Such transboundary issues need to be realized and given adequate attention for conservation to become effective and sustainable (Sharma et al. 2007). Further, communities in and around the transboundary complexes have to put up with intense economic, physical and social vulnerabilities. It is the region’s paradox that while it is biologically and culturally rich, majority of peoples is abysmally poor (Ives et al. 2004). ICIMOD with its partners addresses the push and pull issues of conservation and development through a landscape approach to biodiversity, putting premium on its most important resource – the people, where the communities have been involved in conservation planning together with the national governments. Simultaneously, prospects for enhancing economic
sustainability of the communities as incentives for their efforts towards conservation have also been explored. Extending the transborder conservation experience from Mount Everest complex (Sherpa et al. 2003) to the southern half of Kangchenjunga landscape (KL hereafter), ICIMOD promoted sustainable conservation of globally significant biodiversity areas of the Eastern Himalayas emphasising on peoples’ participation for conservation. The Centre is working on a ‘mountain biodiversity corridor model’ that links together PAs scattered over the landscape shared by three countries namely India, Bhutan, and Nepal (Sharma and Chettri 2005; Chettri et al. 2007).

Conservation is one of the many issues that involve cooperation at various levels of resource management. Many of the past experiences have showed that conservation of biodiversity requires a comprehensive and multi-scaled approach that also considers socio-cultural and socio-economic aspects. Protected area management has been vital to both biodiversity conservation and sustainable development. They are a key to achieving the Millennium Development Goals, particularly those relating to environmental sustainability and poverty alleviation and to contributing towards 2010 targets of World Summit on Sustainable Development (WSSD), that aim towards significantly reducing the loss of biodiversity (Balmford et al. 2005).

PAs are also increasingly being considered in the context of the wider landscape, outlining large-scale biological corridors, ecological networks and transborder protected areas shared between two or more countries (IUCN 2005). In the recent years global communities are advocating cooperation between the countries sharing critical transboundary areas for effective management (Secretariat to CBD 2004). This paper highlights KL’s significance as an important transborder landscape. With a brief discussion on the conservation approach adopted by ICIMOD and the strategic processes involved, the paper focuses on the elements and key features of the ‘Regional Cooperation Framework’ that was developed as a part of conservation framework for achieving transborder biodiversity management in the KL.

2 Significance of Kangchenjunga Landscape for conservation

The KL refers to the southern half of the geographical area surrounding Mount Kangchenjunga that is spread across the eastern Nepal, Darjeeling and Sikkim of India and western Bhutan. It is one of the richest landscapes located within the ‘Himalayan biodiversity hotspots’ (Mittermeier et al. 2004; WWF and ICIMOD
2001), and is an important transborder area for biodiversity conservation being shared by three countries (Rastogi et al. 1997). The landscape faces concerns regarding the need of the ‘landscape approach to conservation’ since conservation efforts in the past had been narrowed down with only the ecological orientation. The human element and their economic sustainability have been deeply ignored (Chettri and Sharma 2006). Further, the strategic location of the KL among three countries is appropriate to promote conservation at the landscape level, which would require a regional approach (Sharma and Chettri 2005).

During the past several decades, conservation efforts in the KL have been focussed primarily on the establishment of PAs. Fourteen PAs have been established in the landscape that range in IUCN management categories from strict nature reserve to national park and conservation areas (Sharma and Chettri, 2005). Considering spatial coverage, they ranged in size from the smallest, such as Jore Pokhari Salamander Reserve (0.04 sq km) to the largest as for Khangchendzonga Biosphere Reserve (2620 sq km). However, these PAs existed as a scattered and isolated ‘conservation islands’ and the rich biodiversity in the KL continued to decline leaving majority of flagship species such as snow-leopard (*Uncia uncia*), tiger (*Panthera tigris*), elephant (*Elephus maxima*), red panda (*Ailurus fulgen*), takin (*Budorcas taxicolor*) and musk deer (*Moschus chrysogaster*) to remain as critically endangered. The most pervasive threat hindering conservation efforts was habitat loss and fragmentation that narrowed down the habitat range of these already small populations of species, isolating them further and making them vulnerable to extinction. Concern for such loss motivated conservation efforts in the KL to be directed towards increasing habitat contiguity through connecting the isolated protected areas with environmentally managed corridors and hence address conservation measures at the landscape level (Sharma and Chettri 2005; Chettri et al. 2007). Developing national networks of corridors linking PAs have been an important strategy for conservation at the landscape level. It is being understood that connecting PAs through corridors provide opportunities for both vertical and horizontal coverage of habitats, ensuring environmental goods and services for the future (Bennett and Mulongoy 2006).

### 3 Regional Cooperation and Transborder biodiversity Conservation

In KL, transborder biodiversity conservation (TBC) has been used as an effective strategy to minimise deterioration of transborder ecosystems. Efforts have been made to coordinate management of landscape that includes protected areas and the intervening land uses; to use conservation as an entry point to enhance
the quality of life of communities living close to the border regions of the three countries; and to support regional integration actions into harmonising national policies and legislation in the management of PAs and intervening lands and to promote regional cooperation so that the joint conservation efforts help minimise conflicts and maintain friendly relationships across the borders (Sharma and Chettri 2005; Chettri et al. 2007).

The regional consultations held in Kathmandu in 2004 provided a platform for the three countries only to share the national conservation and development elements but also to consider the transborder issues prevailing among the three countries. This regional consultation led to the formulation of the Regional Cooperation Framework (Sharma et al. 2007) that sought out the complementarities for regional cooperation and brought forward the elements of national policies with reference to the implementation of goal 2.3 of the Mountain Biodiversity (COP VII/27) and other goals as agreed by the CBD (Figure 1).

Figure 1: Cooperation framework for the KL in context to policy linkages from national to global levels
Based upon the common prioritized issues of over extraction of resources, hap-hazard land use practices, livelihood thrusts and weak enforcement of conservation policies (Table 1), the framework recommended suggestive strategies and actions based on a few principles (Box 1) on transborder biodiversity conservation, scientific and technical cooperation, information exchange, and regional guidelines and soft legal instruments (see Sharma et al 2007). It acts as a guide that can be adapted and applied the CBD provisions to the individual nations within the KL to help address the rootcause of biodiversity loss; to encourage effective conservation planning, implementation of conservation and development actions, and to promote coordination between and among diverse actors engaged in biodiversity conservation.

Table 1: Conservation Issues in the Kangchenjunga Landscape

<table>
<thead>
<tr>
<th>Conservation Issue</th>
<th>KEY COMPONENTS</th>
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<tbody>
<tr>
<td></td>
<td>Bhutan</td>
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<tr>
<td>Resource extraction</td>
<td>– poaching for bile and musk</td>
</tr>
<tr>
<td></td>
<td>– collection of NTFPs</td>
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<tr>
<td></td>
<td>– unregulated collection of medicinal &amp; aromatic plants</td>
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<tr>
<td></td>
<td>– illegal felling of trees</td>
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<td></td>
<td>– collection of fuelwood and timber extraction</td>
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<td>– illegal timber logging</td>
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<td></td>
<td>– firewood collection for sale</td>
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<tr>
<td></td>
<td>– fodder collection</td>
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<tr>
<td></td>
<td>– poaching/hunting and illegal butterfly collection</td>
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<tr>
<td></td>
<td>– over-exploitation of NTFPs</td>
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<tr>
<td></td>
<td>– poaching</td>
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<tr>
<td></td>
<td>– over-harvesting of NTFPs</td>
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<tr>
<td></td>
<td>– poaching (both plants and wildlife)</td>
</tr>
<tr>
<td></td>
<td>– illegal fuelwood and timber extraction</td>
</tr>
</tbody>
</table>
### Land-use systems
- grazing / grazing pressure
- landslide-prone areas
- siltation
- use of chemicals in tea gardens and agricultural lands
- open grazing
- encroachment and habitat destruction
- small-scale forest fires

### Livelihood options
- livestock depredation by wild dogs and leopard
- communities with limited agricultural land and production
- dependency of tea-garden laborers on adjoining forests
- people-wildlife conflict
- improper management of garbage
- high volume of tourists

### Policies
- weak enforcement at ground and forest management practices to adopt more effective participatory approaches
- poor implementation of policies and laws outside the protected areas

Source: Sharma et al. 2007

The framework includes many practical and workable actions such as strengthening the protected area management systems through development of conservation corridors linking PAs; promoting sustainable livelihoods by adopting conservation-linked livelihood options; facilitating creation of working groups to identify research priorities; fostering documentation and exchange of research and scientific and technical data and information; promote educational and capacity building systems in line with the target-group-needs including women; promotion of regional voluntary guidelines for transborder issues and develop mechanisms for joint monitoring of biodiversity and related issues within the land-
scape. The regional framework also suggests provision for Implementation and governance mechanism since the objective of the regional framework is to bring in regional cooperation which could only be achieved through identification of tiers of stakeholders and building working partnership at local, national, regional and international levels. Some of the broad implementation roles identified for the recognised stakeholders in the KL include advocacy, capacity building, global projections and endorsement of regional political statements. Since the framework is an output of the long process of consultations with tiers of stakeholders, it recognises the local and indigenous knowledge and practices and stresses on capacity building for livelihood options, exchange of information on illegal resource extraction and animal movement and also on institutionalizing the process through national and regional committees. The framework thus serves as a functional guide for the countries sharing KL towards a common goal of effective conservation.

Box 1: Principles used in developing Regional Cooperation Framework

| **Participatory Management** – ensuring participation of indigenous and local communities, as well as disadvantaged and socially marginalised groups, for biodiversity conservation and management |
| **Equitability** – ensuring fair and equitable sharing of benefits arising from genetic and biodiversity resources |
| **Sustainability** – aiming for economic, social, and environmental sustainability |
| **Partnerships** – building partnerships among local communities, government/non-government institutions, the corporate sector, and financial institutions. |
| **Ecosystem Approach** – taking an integrated approach into consideration for socioeconomic, cultural, and environmental security |
| **Lessons-learned Approach** – applying lessons learned from other transborder mountain programmes including the Alpine Convention, the Carpathian Convention, and the Mount Everest transborder programme |
| **Transborder Cooperation** – promoting and strengthening transborder cooperation |

Source Sharma et al. 2007
Building onto the regional cooperation framework (RBF), regional strategic document for biodiversity conservation in KL is underway that integrates lessons learnt from the other landscape complexes such as Terai Arc Landscape, Sacred Himalayan Landscape, as well as assembles strategies from the respective national corridor plans, also incorporating strategies to address new environmental challenges such as climate change. The regional strategic document is intended to achieve a landscape level conservation in the KL through four strategic approaches based on transborder biodiversity conservation, livelihood enhancement, environmental security and regional cooperation. It would provide the directions to re-orient and organise national implementation efforts and prioritize actions to enhance and support the regional activities for promotion of conservation in the KL, in particular to addressing specific transborder challenges that include poaching, illegal trading in wildlife and high-value medicinal plants, illegal logging and timber extraction, Lokta debarking, dual citizenship, and customs-related problems.

4 Strategic future directions and implementation mechanisms

The human development context plays a pivotal role in determining whether or not successful management of biodiversity conservation in KL is achieved. However, it is noteworthy that a successful conservation strategy for the KL cannot be achieved in isolation from the development of livelihood strategies for communities and ethnic groups residing in the landscape (Chettri and Sharma 2006). Local communities should have the incentives so that to think beyond daily sustenance activities and engage in conservation activities, which can only be achieved if poor communities have secure and profitable economic and social lives, which would in turn reduce their dependency on fragile natural resource systems. The conservation of natural resource-base is the fundamental component for the KL strategic plan. It involves the protection and sustainable use of biological resources and species including entire species, ecosystems and their services. Major aim would be to customize the CBD (and other global conservation conventions) framework to the KL. Success in doing so will be dependent on wise actions and partnerships between communities and government agencies. The CBD COP encourages the contracting parties to collaborate at the regional level in the development of regional action plans to implement the CBD Programme of Work on protected area and in the establishment of transborder initiatives and multinational biological corridor programmes; also supporting regional agreements for environmental conservation. Regional cooperation will be the corner-
stone of strategic planning and implementation in the KL. The foundations have been laid for integrative regional coordination as Bhutan, India and Nepal have created corridor strategies, integrated such strategies into national biodiversity and strategic action plans, and have also input into the KL Regional Cooperation Framework (see Sharma et al 2007). There is still great potential for these countries to further develop a regional strategy for management by jointly embracing the objectives of transborder cooperation and by committing to effective administration, management, policy, and institutional coordination.

5 Process towards Conservation Planning and developing Regional Framework

The conservation initiatives in the KL was inspired from the decisions of the seventh Conference of parties (COP VII) to the CBD that recommended the ‘Ecosystem Approach’ to biodiversity conservation (Secretariat to the CBD 2004), programme of work for protected areas (COP VII), and by the recommendations of the fifth world park congress (IUCN 2005). This was further guided by conservation development manual developed by Conservation International (Sands son et al. 2003), systematic planning (Margules and Pressey 2000), bioregional planning (Olson et al. 2001) and transborder biodiversity management criteria (Chettri and Sharma 2006). The essence of the initiative was the integrated approach to conservation that promoted partnerships building between communities and government agencies of three countries, Bhutan, India and Nepal for effective biodiversity management.

In collaborations with the government representatives of the three nations, non-governmental institutions and global conservation organisations, preliminary scoping for transborder conservations in the KL was initiated which recommended extension of KL as a critical transborder landscape for biodiversity conservation (Rastogi et al. 1997). The popularity of transborder conservation landscapes (TCL) in which two or more countries cooperate in management and conservation of ecologically important areas located in the border regions had substantially increased in recent years (Sharma and Chettri 2005; GoN/MFSC 2006) and it is evident that such TCL could promote international collaborations, enhance environmental protection across wider landscapes, strengthen participatory conservation measures to mutually harness the environmental services spread across the transborder complexes (Secretariat to CBD 2004; Chettri et al. 2006). Following the initial scoping of identifying and reviewing of existing conservation measures in KL, the necessity for adoption of corridor approach was
evident and the feasibility assessment on re-establishing conservation corridors was carried out. This led to identification of six conservation corridors linking nine protected areas (Sharma and Chettri, 2005).

Conservation corridors interconnect PAs and other relevant territories surrounding them. Human activities are promoted in these areas on sustainable development basis: that is, the activities undertaken do not endanger the rich natural resources contained therein and thus benefits both nations in general and local communities in particular. Conservation corridors are thus a flexible planning tool that interconnects protected areas through combination of land use strategies (see Bennett and Mulongoy 2006). A number of strategic considerations were taken into account while locating the corridors in the KL so as to integrate biodiversity conservation objectives into the land use management outside the PAs and to best respond to the ongoing conservation threats and also to the priorities of the key stakeholders (see Chettri et al 2006; Chettri et al 2007). The strategic process thus progressed through a number of consultations (local, national and regional levels), participatory planning and action researches. Global Information System (GIS) and Remote Sensing Tools (RSTs) were also applied in revalidating the potential conservation corridors. Chettri et al. (2007) give the chronological details of the strategic planning process summarised in Box 2. The process of formulation of national corridor strategies has been quiet demanding in terms of involvement of greater communications, collaborations, trust and understanding building among the diverse stakeholders of the three nations. However, the approach was so designed to make the process more systematic, inclusive and participatory.
During the process three National corridor development strategies, each one from eastern Nepal, Darjeeling (India) and western Bhutan were formulated to bring together the suggestive strategies addressing the country-specific conservation challenges and livelihood needs.

India’s corridor strategies (ICS) reflect on the integrated action on part of the Forest Department, concerning line departments, local councils (Darjeeling Gorkha Hill Council), Panchayats and various community institutions, authorities from the tea-garden and Cinchona plantation, NGOs and various other stakeholders.

ICS puts forth the strategies under the five themes:

i) Biodiversity conservation with strategies addressing forest conversion, unsustainable resource extraction, uncontrolled grazing and human-wildlife conflict;
ii) Sustainable livelihoods that has strategies related to forest dependency, land tenure and agricultural productivity and alternative livelihood options;

iii) Community development with strategies on building physical infrastructure and awareness and education;

iv) Administration and Management that deals with strategies for better management of community functions and settlements and plantations; and

v) Policy and Coordination that has strategies dealing with policy implications and institutional cooperation.

Nepal corridor strategies (NCS) are integrated into Government of Nepal’s broad strategic document of the Sacred Himalayan Landscape, which highlights the strategies on four strategic components of biodiversity conservation, cultural integrity, Water resources and sustainable livelihoods (GoN/MoFSC, 2006).

Bhutan corridor strategies (BCS) reflect on the biodiversity values, socioeconomic and biodiversity conservation issues revealed during the participatory consultations and draws up strategies to fulfil the broader goal of operationalising the corridor plans in relation with the national Bhutan Biological Conservation Complex landscape plans (NCD 2004). These strategies for biodiversity conservation mainly focus on developing integrated measures to mitigate grazing pressures on the pasturelands and prevent habitat degradation of birds; raising awareness among the local communities on the importance of conservation corridors and biodiversity conservation, and for livelihoods, strategies include improving infrastructure for ecotourism and development of micro-enterprises based on incense, broom and floriculture and medicinal and aromatic plants.

6 Conservation Corridors: their role in conservation and peoples’ livelihoods

The 14 PAs in the KL covering an area of 6032 sq km together with six conservation corridors covering 1562 sq km represents 53% of the total area of the KL (Figure 2). The corridors in the KL provide the existing but isolated PAs to the north-south and east-west, linkages with the natural and semi-natural forests. The corridors have been identified using the criteria of existing forest coverage and following natural migration route for animals and also avoiding large tracts of human habitations. The corridor in Nepal connecting Kangchenjunga Conservation Area (KCA) to the Kangchenjunga Biosphere Reserve (KBR) in Sikkim and Barsey Rhododendron Sanctuary and Singhalila National Park of India is
mainly dominated by private forests and agroforestry systems, while the remaining five corridors in India and Bhutan mainly have reserve forests under government ownership. In general, the corridors identified are areas covered with forests including community forests, reserve forests, agricultural lands and pastures. Although, the identified corridor areas in India are affected by intense human activity, the forests are still extensive and very resilient and serve as an important link that would significantly increase connectivity among two well established national parks and two wildlife sanctuaries. Except for small gaps at occasional places, the proposed alignments for corridors, more or less, followed a continuous belt of forests that are under government ownership and management. Besides, there are very few human habitations in the form of forest villages inside the corridor areas in Darjeeling. The corridor in Bhutan linking the Toorsa Strict Nature Reserve (TSNR) with the Jigme Dorji National Park (JDNP) is a part of biological conservation corridor network (BCCN) in Bhutan has 70-89% of land area under the forest and also had extensive pastureland. The corridor is significant as it hosts 10 of the 14 classified ecosystem types in Bhutan (Sherub 2004).
There are a number of conservation challenges linked with the corridors that varied in nature from landuse transformations, unregulated tourism, deforestation, unsustainable harvest of biodiversity resources and access to resources. There were issues related to wild life disappearing due to biotic pressure and poaching and drastic changes in their habitat. Many forested paths had been broken up due to encroachment, cultivation, extensive grazing and illegal extraction of resources. In many cases, either construction of recreational areas and parks for tourism was a matter of concern or the human-wildlife conflict was a major issue.

Besides, there were several other factors such as lack or shortage of drinking water, lack of infrastructure and good communication network systems that impeded economic growth and hindered the conservation actions. Thus, the most pressing challenge was to enhance the environmental services, and at the same time, improve the livelihoods of the communities that are dependent on these resources.
Livelihood is a critical component in a conservation paradigm and integration of community development for meeting conservation goals is an important feature of landscape approach to conservation. In the KL, transfer of traditional practices and skills have been taking place at the people-to-people level from time immemorial just as the cultural exchanges that have been binding the communities across the political borders (Oli 2004). Majority of the people residing the corridor area are economically vulnerable with their livelihoods mostly revolving around the subsistence agriculture and use of forest resources, whereas in some areas tea-gardens are the primary source of income. The national consultations brought out several challenges related to inaccessibility to resources and lack of alternative livelihood opportunities or lack of capacity for adapting new economic intervention. In some instances, infrastructure was the issue; and in other, lack of modern technologies or the market information for agricultural and non-agricultural products. The socioeconomic studies revealed that the corridor areas have huge conservation-linked livelihood potentials such as micro-enterprise development based on NTFPs, off-season vegetable crops, organic vegetable, agroforestry and community-based tourism and for the animal-based products.

7 Conclusions

The KL has been seen as the ‘cornucopia of living treasures’ having a wide spectrum of ecological zones (tropical, sub-tropical, warm temperate, cool temperate, sub-alpine, and alpine), critical ecosystems, and species of global conservation importance. Prior to the KL initiative of ICIMOD, little coordinated efforts were there to conserve this globally significant biodiversity landscape. With the realisation that earlier efforts of protecting biodiversity through creating protected areas are not adequate, ICIMOD’s initiative brought together three nations to address conservation in the KL at the landscape level. It was made understood that conservation required a holistic approach at the landscape level that integrates biological, socio-cultural and economic elements into the conservation framework. The initiatives gave strong emphasis to the community development at the local level, followed by regional cooperation at the regional level to meet and comply with the global commitments. Partnership building across the tiers of stakeholders and promoting community-based conservation (CBC) in and around the protected areas were the major working modalities. It established a platform to analyze and achieve clarity at the corridor-level biodiversity conservation targets; and worked out the general guidelines for defining these targets. The integration of the participatory corridors’ plans into the management of the KL is
a positive and productive step in the development of this transborder initiative, which demonstrates the synergy between the conservation and development. However, there is still a strong need for the three countries to establish regional transborder cooperation for biodiversity management in the KL in addition to achieving each country’s specific national conservation targets. The experience shared in the paper on tranborder biodiversity management reflects different modalities and levels of cooperation and points towards the regional harmony, peace and cooperation.

8 Acknowledgements

ICIMOD acknowledges the MacArthur Foundation for the grant they provided to support the establishment of conservation corridor in the Kangchenjunga Landscape. The authors are thankful to the Governments of Nepal, India and Bhutan for their leadership, cooperation and support. The authors are also grateful to all the partners and the local communities from Bhutan, India and Nepal who have contributed to this initiative. The opportunity provided by INWENT and ICIMOD to bring this paper in the forefront in the workshop is deeply acknowledged.

9 References


4.5 Cross-Border Cooperation for Biodiversity Conservation and Sustainable Development: Case Studies on Karakoram, Hindukush and Pamir

Ghulam Amin Beg

Abstract

This paper provides an overview of the bio-context of the Karakoram, Hindukush and Pamir regions, besides presenting a snapshot of the biodiversity resources in terms of rare wildlife and abundant plant species and the stresses on biological resources and the habitat conditions and local strategies to manage it.

While bringing the global context, the paper argues that transboundary biodiversity conservation is a relatively old phenomenon; and the most recent analysis in 2005 indicates a total of 188 internationally adjoining complexes involving 818 protected areas in 112 countries (IUCN, WILD 2005). The study recaps that the shift from Protected Area (PA) management model to creating linkages with livelihoods of local communities through economic substitution and incentives for conservation is gaining currency, contributing to conservation, livelihoods and regional cooperation goals. Conservation is no longer perceived as creating isolated islands of protection and refuge, but as a means to create opportunities for cooperation, knowledge and experience-sharing and sustainable development.

The paper also identifies key actors, and conservation approaches that are implemented in the individual countries in this eco-region. The notable conservation actors are the Khunjerab National Park and the Central Karakoram National Park in Pakistan; Taxkorgan Natural Preserve in Xinjiang, China; Tajik National Park in Gorno-Badakhshan, Tajikistan; and Big Pamir Wildlife Reserve in Wakhan, Afghanistan as some of the designated protected areas around the borders of these four countries. Besides, assessing few notable community-based conservation initiatives like the Mountain Area Conservation Project (MACP) with the

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support from international conservation agencies like the World Conservation Union (IUCN) and funded by GEF/UNDP and the Ministry of Environment in Pakistan; and initiatives taken by the Wildlife Conservation Society (WCS) in Afghan Wakhan and the Aga Khan Development Network (AKDN) in Tajikistan in Tajik Wakhan are to create economic substitution and promote nature-based tourism products.

The paper addresses the current resource-governance and institutional anomalies in biodiversity conservation and indicates major challenges in protected area management and community based approaches. It assesses the diverse experiences and examples from the four countries reflecting on major thematic concerns like community-based conservation, participation, empowerment and sustainability and localization and regionalization in mountain regions.

In conclusion, the paper discusses future prospects for cross-border biodiversity conservation and sustainable development in the region, highlights challenges and linkages of inaccessibility and interdependence, scope for transborder cooperation for conservation, knowledge-sharing and exchange relations; and promotes the notion of integrated planning and development of the natural, cultural and built environments to protect biodiversity, improve livelihoods of local communities and to reduce natural disaster risks.

1 Context

1.1 Geographical setting and socio-economic position

The region is a complex of many mountain ranges hosting high peaks, long glaciers, large river systems and beautiful plateaus. The Pamir serves as the hub or knot from which stems most of Asia's giant mountain ranges: the Karakoram, Hindukush, Himalayas, Kunlun and Tian Shan. This was the region, where once three giant empires met: the Czar, the Chinese and the British, and whereon today boundaries of the four nation states-namely, China, Afghanistan, Tajikistan and Pakistan-converge.

The Pamir region is further sub-divided into three sub-regions: the Eastern Pamir, that is, comprised of much of Gorno-Badakhshan Autonomous Oblast (GBAO), Tajikistan; Wakhan Pamir of the Woluswali Badakhsan, Afghanistan; and Sarikol, Taghdumbash Pamir of Taxkorgan, Xinjiang, China (Kreutzmann 1996, 2007).
Much of the western Himalayas, Karakoram and Hindukush cover the present day Pakistan-administered Northern Areas comprised of Gilgit, Hunza, Baltistan, Astore, Diamer and Ghizer besides Chitral, a northern district of North West Frontier Province (NWFP) of Pakistan and the Wakhan Corridor of Afghanistan.

The region is characterized by rugged mountains and is generally prone to multiple hazard risks and disasters, both natural and human-induced. Being a landmass of immense contrasts, the area receives less than 200 mm precipitation per annum, with temperatures going as high as 42 to as low as -22 degree Celsius.

The socioeconomic conditions of the region are also diverse and steered by inaccessible and severe weather conditions. Although generally considered as poor, marginalized and remote communities, but one thing is very clear that diverse ethno-linguistic groups with varying cultural and religious traditions sparsely populate the valleys. Among these minority ethn-linguistic groups, the Wakhi sedentary and the Kirghiz yurt dwelling communities dominate the border regions. Livestock-keeping and farming on limited patches of mostly irrigated arable-land that form the traditional subsistence economy of the growing population. Increased spatial mobility, newly diversified off-farm activities and external interventions in the form of rural development initiatives and construction of road networks have been contributing to the socio-economic changes and influencing cultural traditions and putting pressures on natural resource use patterns (Kreutzmann, 1991, 2003). The population is heavily dependent on nature and exploitation of natural resources for goods and services to improve their livelihoods.

1.2 Overview of biodiversity resources and pressure in Karakoram, Hindukush and Pamir regions

The region is considered to be a hotspot of rich biodiversity. Among the endangered mammals listed are snow-leopard (*Uncia Uncia*) and brown bear (*Ursus arctos isabellinus*). Other mammals found are blue-sheep (*Pseudois nayau*), Markhor (*c.falconeri*), ibex (*capra ibex sibirica*), marmots (*marmota caudate*), wolf (*Canis lupus*) and an argali subspecies known as Marco Polo-sheep (*Ovis ammon polii*). In the Khunjerab National Park in Pakistan and Taxkurgan reserve, China, Kiang or Tibetan wild ass is also reportedly found (Schaller, 1987).

Among the birds species, a number of migratory and endemic species are common. Golden eagle, bearded vultures, rock and snow pigeon, ducks, rock partridges, Himalayan snow cocks and other alpine birds are reportedly com-
mon. High altitude wetlands and lakes are found among the glaciers and with potential risks for GLOFs.

Mainly above 4000 m, the permanent snow-fields and cold desert form the highest parts of the region. The cold-desert plants include low and branching shrubs, dense turf-forming grasses, and alpine thin steppes. Alpine-meadows occur below glaciers and on areas where snowmelt provides conditions for vegetation (IUCN, 1999). The alpine forest scrub, birch and juniper forest is found, but threatened by deforestation.

Alpine flora of the region is also diverse having medicinal plants of aromatic and economic value. Among some of the common are Zeera or cumin (carum spp.), artemisia maritimia (afsanteen), saussurea lappa (kut) and Podophyllum emodi (Bankakri) found in Karakoram, western Himalayas and Hindukush area (Rasool, 1998).

The notion of the stress on the rich biodiversity resources in the Karakoram-Hindukush and Pamir region is not a recent phenomenon. Human-wildlife conflict amongst primitive and pastoral communities has remained an unsettled subject. Competition for grazing, predation and habitat degradation were some of the contentions. Hunting or killing of wild animals has, therefore, remained one of the ancient sports and was seen as an important instrument for personal and food security for human beings, especially in the mountain areas. However, over the time, it was practiced with restraint. The folkstories, art and folksongs from the mountain communities provide enough evidence that there were diverse traditional ethics of conservation and principles embedded in the socio-cultural and spiritual traditions of various mountain communities in different times. Narrations of these indigenous knowledge resources tell us, for example, that minors, young and milking wild animals were not to be hunted. The bigger the horn and older the hunt, the higher was the prestige and honor for the hunter. *If you kill a milking Ibex, you will get blind³*. Hence principles, methods and approaches were in place for co-existence and wise-use of wild animal resources for centuries.

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³ Old Wakhi hunters in Gojal, Hunza for example tell young hunters and narrate evidences that how a hunter killed a milking ibex and got blinded on the spot and was brought to the village by his co-mate. Or when alone on hunting mission, died of cold, hunger, or become prey to wolf and fell down. Others would say these wild animals are *Mergech*-flocks of fairy, and if you kill young and milking animals the Fairies will curse the hunter and they die or become sick for ever.
However, anthropogenic pressures increased with increase in population, settled agriculture lands, social and political conflicts, cross-border quest for control of land and resources, new and improved transportation mechanisms, road networks, introduction of new warfare tools in the shape of horses, axe, guns and later automatic machine guns fixed on helicopters etc., and mobilization of army and security forces in fragile and natural resource rich areas led to indiscriminate slaughter of animals and destruction of forests and other natural resources. This has been a common and major contributor to threatening biological resources in the Karakoram, Hindukush and the Pamir region, which has seen many expeditions, wars and conflicts over centuries, and even continues to this day.

The natural pressures in terms of the sheer scale and frequency of multiple natural disaster events, severity of weather conditions, predations and spread of diseases etc. were also common in these mountain regions. With growing concerns about global warming, retreat of glaciers, thinning of snowlines and secondary hazards events like avalanches, GLOFs and landslides, the natural habitat and the biodiversity resources continue to remain under immense pressure in these fragile areas.

Conservation efforts started in the 1970s through the government’s regulated “protected area management”, which declared biodiversity hotspots as “game reserves, wildlife preserves and management of the National Parks solely by government. Isolated refuges were created for wildlife so that to prohibit human intrusion, mainly interference by buffer communities, who were considered as threat; but in reality, the buffer communities were depended on the use of natural resources and shared the habitats.

1.3 Resource Governance and Anomalies

1.3.1 Protected Areas

Designation of the Protected Areas (PAs) as an instrument to conserve the natural resources started in the 1960s. Although, many areas like the Pamir-i-Buzurg (Big Pamir) in Afghan Wakhan and the Khunjerab area in Hunza Pakistan remained hunting sites (Shikargah) for the Kings and local rulers but formal control of the designated Khunjerab area as National Park by the state started in 1975 on the technical advice of the renowned biologist Dr.George Schaller. The Big Pamir Wildlife Reserve was created during King Zahir Shah’s reign. The Taxkurghan Natural Preserve was established in 1984 and the Tajik National Park in Gorno-Badakhshan in 2000. In Pakistan, three other protected areas,
Central Karakoram National Park (CKNP), Handarap-Shandur National Park and Deosai National Park, were notified in 1993–1994.

1.3.2 Management of the National Parks and Reserves

These parks and reserves are governed through a hierarchical system where the National or Federal Ministries and agencies are responsible for providing overall legal and policy frameworks. The regional Forest and Wildlife and Park departments manage and monitor the implementation of regulations and policies, and the Park managers are involved in day to day management and operations. Parallel to this, there are scientific institutions like the Academy of Sciences in Tajikistan and China, and Universities involved in biodiversity research that provide technical guidance, and monopolize science. In the case of Pakistan and Afghanistan, universities and research institutions are not directly involved. However, the Pakistan Forest Institute, Peshawar, produces human resources for natural resource management. Besides, international conservation organizations like IUCN, WWF and WCS provide technical advice and assist the governments in policy formulation and implementation.

1.3.3 Coordination with other Agencies

As these protected areas are at the international borders and also fall in the jurisdiction of the local governments, therefore, there are other agencies involved whose presence in or around the Park area impacts the conservation efforts. Despite the fact that Park laws and management categories disallow extraction and presence of other agencies, expediency demands that security agencies, road construction departments, agriculture and water resource departments, mining and exploration agencies and custom and immigration agencies need to continue existence, adding to the complications of resource governance and management.

1.3.4 Staff Capacities

The Park management is also neutralized due to limited presence of the staff in the park area, owing to severe weather conditions, apathy and lack of incentives for staff. In all cases, the Park directorates are based away from the Park in the city and town areas, administratively controlled by the line departments of Forest and Wildlife at the sub-regional level. The staffs in the field are generally watch and ward persons and wildlife guides hired from the local community.
1.3.5 Participation

The communities were traditionally seen as threat to protected areas, and the perception still continues in most of the cases among mid level officials. However, of late, the role of local communities and the private sector (outfitters and tour/hunting companies) have been realized. Different strategies are being adopted to link livelihoods with conservation ranging from benefit sharing from the protected area management (in the case of Khunjerab National Park) to creating economic substitution projects and provision of incentives to the communities in the buffer (Community-Based Trophy Hunting in Pakistan under MACP).

1.3.6 Anomalies in conservation and development

With regard to conservation campaign and development, there are still many anomalies that need to be addressed. Adopting a conservation model that fits the realities on the ground and marrying the conservation and development goals remains a big challenge (IUCN 2007). There is very little application of the broad array of protected area management categories of IUCN with the exception of category-II National Parks. In most of the cases, due to the conventional thinking and slow pace of change processes, the policy makers are hooked to the one-category and not ready to accept change or try new innovations based on science and changing ground-realities. However, there is now growing realization that more participatory, sustainable-use and landscape-level approaches are required. Border demarcation, adopting zoning systems, conducting methodological surveys and creating substitution and incentives for livelihoods improvement are seen essential prerequisites for conservation (CKNP, 2007).

1.4 Major Actors and Initiatives

1.4.1 Government Agencies

The central government’s Forest Administration and Environment agencies are the key actors in protected area management and biodiversity conservation in all four countries in the region.

In the case of Tajikistan, the Director General, “Tajik National Park” is based in Dushanbe and gets advice from the Ministry of Agriculture, Nature Protection, Land Use Department and Forest Agency. There are regional and field offices in Gorno-Badakhshan, for instance, in Khorugh, Murghab and other areas in the park. Local and regional institutions and departments are involved for coordination and implementation.
In China, the State Forest Administration in Beijing is responsible for protected area management. The “Tashkurghan Nature Reserve” is managed by the administration through its office in Urumqi and Kashgar. There is a field office in Tashkurghan.

The National Environmental Protection Agency (NEPA) of Afghanistan is responsible for protected area management in Afghanistan. At the provincial and local levels the structures are still vague due to lack of capacities. However, recently, local elders and Shuras, i.e., councils, at the village level are involved in conservation and protection.

The draft of „NEPA strategy paper” drafted in March 2007 says: ...while the Wakhan Corridor contains healthy populations of endangered snow leopards and other mammals including Marco Polo sheep, active hunting is occurring in many regions of the country, either for sport, for food or in order to supply furs for sale to foreigners in Kabul. The legal status of all protected areas is currently in question. The protected area regulations and management plans are currently under development, but no management is taking place to protect and conserve their ecological integrity’.

In Pakistan the “National Council for Conservation of Wildlife (NCCW), the Inspector General Forest, and Ministry of Environment”, provide overall guidance and coordinate the states of affairs of protected areas management in the country under the national laws and regulations. The provinces have developed their own laws, regulations and strategies to meet national and provincial goals.

Likewise, in the Northern Areas, the Wildlife is managed under the Northern Areas Wildlife Act 1975. The Chief Secretary acts as the Chief Conservator and implements policies and plans through the Conservator, Forest, Wildlife and Park Directorates. There are four national parks, nine game reserves and more then 20 community controlled hunting areas, besides two conservancies.

1.4.2 Academia, Research and NGOs

In Tajikistan, the Academy of Science provides technical advice, besides consulting with farmers’ associations and NGOs, like ACTED, active in environmental protection.. Besides, the Mountain Societies Development Programme (MSDSP) is involved in large-scale rural development, economic development and social mobilization in the Pamir region around the protected areas.

In China, assisted by the Academy of Sciences and the Universities involved in natural science research, both directly from the centre and through the provincial
chapters, the “State Forest Administration and the “Wildlife and Plants departments” interact with local government in Urumqi and Tashkurgan county and with other security agencies to manage the “Tashkurgan Nature Reserve”. Dr. George Schaller and the team of Chinese scientists from the academy of sciences and the China office of the Wildlife Conservation Society (WCS) have been working in the reserve for the last many years. They have conducted Pamir argali surveys, trained the reserve staff in surveying, monitoring and using monitoring equipments, besides raising awareness. Currently, Professor Shi Kun from the Beijing Forestry University is conducting research on snow-leopard in the reserve. Zhang Kejia of WCS is doing a community survey, mainly focusing on standard of living of the nomads, the husbandry status, the conflict between wildlife and livestock, etc. WCS and the authorities are planning to promote ecological-tourism, after carrying out an initial assessment. They hope the tourism could be initiated next year 4.

In Afghanistan, again WCS is conducting wildlife surveys, assisting the government of Afghanistan in formulating the Wildlife laws and creating new protected area, training wildlife staff and mobilizing local communities for conservation. The Aga Khan Development Network (AKDN) is also a major actor assisting the government of Afghanistan and the local communities to create economic substitution, diverse the economic base by focusing on human resource development, social development and tourism promotion. Both WCS and AKDN are separately encouraging promotion of community exchange (cultural exchange) between Pakistan and Afghanistan in the Pamir region so that the latter could learn from community-based experiences in the Northern Areas, especially in Gojal Hunza, in the buffer of Khunjerab National Park.

In Pakistan, a number of international organizations mainly the World Conservation Union (IUCN), besides, World Wide Fund for Nature (WWF), Wildlife Conservation Society (WCS) and Himalayan Wildlife Foundation (HWF) are actively working in partnership with the government and local communities for conservation of nature and natural resources in the Northern Areas for the last many years. Major initiatives undertaken are formulation of the “Northern Areas Strategy for sustainable Development (NASSD), implementation of GEF/UNDP funded “Mountain Area Conservancy Project (MACP)”, development and implementation of the Management Plan for Khunjerab National Park and Deosai National Park; and currently, development of management planning framework

4 Email exchange with Zhang Kejia, WCS China, who was doing field work in Taxkorgan Reserve in November 2007
for Central Karakoram National Park (CKNP) with the support of IUCN and the HKKH Partnership project⁵. IUCN and the WCS assist the Federal Ministry of Environment and the Northern Areas Forest and Wildlife Department in developing feasibility to establish Wildlife Rehabilitation Centre at Naltar after the translocation of an orphaned snow-leopard cub to Bronx Zoo in the USA under captive breeding programme. Besides, the Aga Khan Rural Support Programme (AKRSP) and other AKDN institutions are actively involved in rural development, economic and social development of local communities in the buffers of the protected areas.

2 Conceptual Framework

2.1 Protected Area Management Concepts

Historically, a common approach to protecting biodiversity was “to create a park or protected area and excluding the people and livelihood activities”. Kings and governments applied this everywhere over the last one hundred years or so. The objectives remained isolating an area for leisure and sports, protecting a national heritage, claiming sovereignty and/or acquiring economic benefits for the King or the state. Interestingly, these objectives were not set to serve public interests, but rather they always excluded the public. (Salafsky 2000). In majority of cases, roughly most of the aims remain unmet.

Globally, the IUCN’s Protected Area Management Categories system provides an internationally recognized conceptual and practical framework for planning, management and monitoring of protected areas (IUCN 1999). The IUCN definition of protected areas⁶ is also considered as the overarching criterion, however.

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⁵ The HKKH Partnership project is a partnership for ecosystem management currently implemented using a transboundary approach in Sagarmatha National Park Nepal, QNP Tibet, China and Central Karakoram National Park, Pakistan by IUCN in partnership with ICIMOD, Evk2.CNR and CESVI with funding support from Italian Cooperation (DGCS)

⁶ “an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity and of natural and associated cultural resources and managed through legal or other effective means”(IUCN, WCPA 1992).
Protected Area management is a complex process requiring consideration of multiple factors and relationships. Any conceptual framework for protected areas should, therefore, first analyze biodiversity changes, rangeland status, socio-economic conditions and dependencies of local communities on the resources, resource-use perceptions of various stakeholders and the land-use history and agricultural patterns, and overall relationship between food, water and land and its various users, whether wildlife, ecosystem, livestock or people and their rights etc. (IUCN 1992). Without a sound understanding of the science and the socio-economic processes and cultural traditions of the area, adoption of a particular management category will not achieve the desired goals and results.

2.2 Community-Based Paradigm

In the community based biodiversity conservation paradigm, it is accepted as a norm that local people in remote and fragile ecosystems often rely on products, services and land to meet their livelihood needs. This dependence creates both positive and negative stresses on biological resources. Many projects have demonstrated that if communities’ traditional ownership and usufruct rights to sustain-use the resources are accepted, they are involved in the management of the natural resources and if they get benefits in economic terms; they become the champions of conservation and manage the resources at a less cost to the exchequer and contribute to the objectives of protection and economic benefits (MACP 2006).

There is a strong link between conservation and livelihood needs of the people. Creating economic substitution and incentives for conservation contributes to the objectives of reducing threats to biodiversity and the habitat, both internal and external (Salafsky and Wollenberg 2000).

2.3 Transboundary Concept

There is a growing realization that protected areas are managed as isolated conservation ‘islands’. Generally, even within a country or between bordering provinces and in neighboring protected areas, there is no or limited sharing of knowledge and experience. This is more so across political borders.

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7 There are six categories for PA management elaborated by WCPA/IUCN.
The Convention on Biological Diversity (CBD) and the Conference of Parties (COP) of the CBD adopted a Mountain Programme, which promotes concepts of regional and transboundary collaboration at the landscape level for research, adaptive management, exchange of knowledge and expertise and joint surveys. Globally, transboundary biodiversity conservation is a relatively old phenomenon and the most recent analysis in 2005 indicates a total of 188 internationally adjoining complexes involving 818 protected areas in 112 countries (IUCN, WILD 2005).8

There are lessons in these experiences to accentuate the need to create transboundary conservation corridors in biodiversity hotspot areas, promote PA to PA exchange and learning, adopt community-based and participatory approaches, and promote landscape, integrated and partnership approaches for effective biodiversity conservation and livelihoods improvement.

Such cooperation will result in reduction of illegal poaching and trade of endangered species, control cross-border spread of livestock diseases, improve living conditions of local people and would enhance the vitality and sustainability of the common natural resources.

3 Cases and Experiences from Karakoram, Hindukush and Pamirs

This section presents four experiences and cases from the protected areas in the Karakoram, Hindukush and Pamir region. It describes the biodiversity resources

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8 IUCN, WILD et al. (2005). Transboundary Conservation – A new vision for Protected Areas (CEMEX)
of the conservation areas, the actors, current activities and challenges faced to contribute to biodiversity conservation goals.

3.1 case study: Tashkurghan Nature Reserve, Xinjiang, PR of China

The Tashkurghan Nature Reserve (TNR) was established in 1984 in the Tashkurghan Tajik Autonomous County of the Uyghur Autonomous Region of Xinjiang province. The County consists of about 15,863 sq. km of mountainous terrain, most of it above 3000 m, including rolling hills of the Pamirs in the west and Chogali (K2), 8611 m, the second highest peak in the world, in the east (Schaller, et al. 1987)

The total area of the Tajik County is 52,400 square kilometres bordering with the Khunjerab National Park in Pakistan, Afghan Wakhan and Tajikistan’s Gorno-Badakhshan region and Raskam area in Yarkand County.

The aim of the reserve is “to protect animals and plants, to preserve for future generations a natural community that represents the country’s heritage”. Since 1981 Chinese scientists and the US-based Wildlife Conservation Society (WCS) conducted many wildlife surveys in the Reserve and have recommended many actions. Major wildlife species found are Marco Polo sheep, ibex, snow leopard, brown bear, wolf, Tibetan Wild Ass, Marmot.

The major threats and challenges, that were identified during their surveys in 1985–86 by Schaller, Hi Hung, Talipu and others, were as follow:

“Human habitation are present inside the reserve settled by Tajiks and others. They grow wheat and other crops, at the elevations as high as 3900 m. They graze livestock and compete with herbivores for limited vegetation. Village hunters used to hunt wild sheep and goats for food, threatening the wildlife population and also depriving snow-leopard and wolf of their natural prey. This has now declined as the government has banned carrying guns and without license hunting. Since the natural prey of carnivores is scarce, snow leopard and wolf attack livestock. As a result, the leopard and wolf are shot or trapped. Since the local people are dependent on the natural resources, and they cannot be removed from the area. Therefore, the government and reserve authorities are working on regulations and management guidelines for enforced”.(Schaller, et al, 1987)

The survey team made many recommendations in 1985 advocating for creating economic substitution and providing incentives for the community to reduce livestock numbers, even abandon traditional-farming and livestock-keeping.
“It would be detrimental to the long-term well-being of the local people if livestock production were increased without taking range and animal quality into consideration. Most pastures are already filled beyond capacity, and a simple increase in livestock will merely turn more slopes to desert, of use neither to domestic nor wild animals. To improve living conditions of local people, new approaches are needed, approaches that do not harm the land further. Growing fruit (for export of dried fruit), and making handicrafts (for sale to tourists) might provide additional income to the rapidly growing human population” (Schaller, et al, 1987).

These issues and challenges seem to be relevant even today, though a number of actions have been taken.

### 3.1.1 Current Initiatives

Currently there are few researchers and NGOs working on biodiversity and conservation in the reserve. For example, snow-leopard survey is being carried out by Professor Shi Kun from Beijing Forestry University since August 2007. WCS China works in the region for several years. Apart from the Pamirs argali surveys carried out in 1985, 1986, 1987 and in 2005, WCS also held two training workshops in Tashkurghan in 2006 and 2007 for the reserve staff and others who are responsible for the wildlife patrol and monitoring. Around 65 participants took part in the workshop and learnt methods of wildlife identification, monitoring, GPS use and survey methods. Besides, a community survey is in progress, mainly focusing on standard of living of the nomads, the husbandry status, the conflict between wildlife and livestock, etc. WCS and the reserve officials are also planning to conduct an assessment to promote eco-tourism in the area aiming to start eco-tourism next year.

The Reserve has conducted public awareness of wildlife protection in the county involving the communes. Awareness levels are reportedly increasing.

“In recent years, the local nomads saved more than 100 individuals of wildlife including some endangered species like argali and ibex that got hurt or were sick in wild. Moreover, 9 nomads joined the monitoring and patrol team of the reserve as part-time staff. They are very experienced and familiar with the topography of the area, and give a great help to the reserve management”

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9 Zhang Keija of WCS reported from Taxkorgan in email exchange in November 2007
3.1.2 Current Issues and Challenges

- **Population Growth**: Generally, the population growth is high in the county. People live inside the reserve and are dependent on the products and services offered by the ecosystem.

- **Livestock-wildlife conflict**: The livestock number has increased over the years. That is directly resulting conflict over grazing and habitat between the livestock and the wild ungulate like argali and ibex.

- **Human-Wildlife Conflict**: Snow-leopards frequently attack the livestock and bring a considerable loss to the communities. Therefore, the most problem or challenge facing the reserve is taking an overarching conservation and develop goals balancing between community development and wildlife protection.

- **Lack of compensation for livestock loss**: Tashkurghan is one of the poorest counties in China; and the communities are not compensated for the livestock loss. So, how to reduce the livestock number without decreasing the communities’ income? What is the best way to solve this problem?

- **Mining and Extraction**: In some areas, active mining is undertaken that is disturbing the wildlife, destroying their habitat and creating long-term environmental-risks without proper mitigation-measures.

- **The Karakoram Highway (KKH) and its Expansion**: The KKH passes through the reserve. Hence there is active flow of human and vehicular traffic having adverse effects on wildlife and the habitat.

- **Lack of Staff Capacity**: In addition, the reserve has only 15 staff including the 9 part-time nomads in contrast with the too large area of the reserve. So, the manpower is too short for effectively managing the whole reserve. This is also noteworthy that the reserve is still a provincial level-one that could get very few financial supports from the government. Thus, the equipments for monitoring are in shortage.

- **Presence of other agencies in the Reserve**: The Reserve is in an international border with an active trade and travel. Therefore, a number of agencies including security, immigration, customs etc. are proactive in the reserve area. This is situation, therefore, creates challenges for the Reserve authorities to pursue conservation goals.
– **No communal experience-sharing and exchange in the border area:** The Khunjerab National Park and the Tashkurghan Nature’s Reserve area are geographically one region but divided by the political borders. However, until now, there has been no Park-to-Park exchange and efforts for transboundary protection in this area.

Although, in 2006 the Wildlife Department and State Forest Administration in collaboration with the WCS, China, organized four national transboundary conservation Conference in Urumqi, but the Reserve has not yet established any cooperative or coordinative relationships with other three countries on the transboundary protection.

Early this year, on the invitation of the Northern Areas government supported by WWF Pakistan, a delegation of Xinjiang Institute of Ecology and Geography of the Chinese Academy of Sciences and the Wildlife Conservation Association, Xinjiang visited the Northern Areas. Thus, the cross-border conservation cooperation were discussed with officials and conservation agencies. The delegates also visited the Khunjerab National Park and the IUCN/MACP supported community-based conservation projects in the buffer area of the park. However, it is not known whether or not the experience of the neighbor was shared with the Taxkorgan Nature Reserve officials.

### 3.2 Case study: Khunjerab National Park, Pakistan

The Khunjerab National Park (KNP) borders with the Tashkurghan Nature Preserve (TNR) on the Sino-Pak border in Hunza valley. The KNP has two main complexes, the Khunjerab and its allied valleys, and the Shimshal Pamir region. At an elevation of 3000 meters to 5500 meters above sea level, the park hosts numerous valleys, large peaks, glaciers, lakes and a unique landscape.

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10 Though the Shimshal community has not accepted the unilateral designation of their pastures and rangelands as protected area, but the Park authorities are developing incentive mechanisms to create alternate opportunities and to involve the community in co-management of the Park. For earlier assessments of the KNP performance and community response cf. Knudsen 1996, Kreutzmann 1995.
KNP was established in 1975, and the geographical size was initially notified as 2270 sq.km. But in November 2005, the park was extended to 5544 square kilometres\textsuperscript{11}. The main purpose of establishing the park was “to preserve and protect the rare species of wildlife such as Marco Polo Sheep & Tibetan Wild Ass, Ibex, Snow-leopard, Blue Sheep, Brown Bear and Wolf and their habitats.

The Northern Areas Wildlife Preservation Act 1975 regulates protected areas in the Federally Administered Northern Areas of Pakistan including the KNP. Under the Act, any “comparatively large area of outstanding, scenic, merit and natural or cultural interest could be declared national park with the primary objective of protection and preservation of scenery, flora and fauna in the natural state to which access for public recreation, education and research may be allowed” (WWF/KNP, 2004). The Act also permits the provincial government to alter the boundaries of such areas from time to time as deemed necessary.

Besides the main Khunjerab valley, other sub-valleys in the Park such as Dhee, Qarchanai, Tunga-ridge, Ghuejerab, Fuerzin, Goshghil, Barkhun, Arbob hel and Kueksel are also rich in wildlife and flora (KNP 2007). The Qarchanai valley is the main habitat for Marco Polo sheep.

Table 1: Wildlife Census: Khunjerab National Park 2005

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Marco polo sheep</td>
<td>300</td>
<td>52</td>
<td>37</td>
<td>65</td>
<td>57</td>
</tr>
<tr>
<td>2</td>
<td>Blue sheep</td>
<td>35</td>
<td>691</td>
<td>1813</td>
<td>1651</td>
<td>1041</td>
</tr>
<tr>
<td>3</td>
<td>Ibex</td>
<td>395</td>
<td>1758</td>
<td>3190</td>
<td>5184</td>
<td>6172</td>
</tr>
<tr>
<td>4</td>
<td>Snow leopard</td>
<td>5</td>
<td>15</td>
<td>25</td>
<td>52</td>
<td>66</td>
</tr>
<tr>
<td>5</td>
<td>Wild hare</td>
<td>12</td>
<td>43</td>
<td>108</td>
<td>349</td>
<td>412</td>
</tr>
<tr>
<td>6</td>
<td>Brown bear</td>
<td>28</td>
<td>33</td>
<td>49</td>
<td>28</td>
<td>32</td>
</tr>
<tr>
<td>7</td>
<td>Wolf</td>
<td>45</td>
<td>90</td>
<td>136</td>
<td>54</td>
<td>70</td>
</tr>
</tbody>
</table>

\textsuperscript{11} The area was extended vide Notification No.F&A 8(4)/F/01 dated 22\textsuperscript{nd} Nov, 2005 from 877 Sq.Miles (2270 Km\textsuperscript{2}) to 2141 Sq.Miles (5544 Sq. Km) & lies between geographical coordinates longitude 74°-55´ E to 75° 57´ E and latitude 36°-01´ N to 37°-02´ N. (KNP Directorate 2007)
The table above (table 1) shows that there is a consistent increase in the number of wildlife species in the Park area in all counts. The population of both the herbivores and carnivores have increased. There are reports of increased attacks by snow-leopards on ibex flocks.

The Park also has a number of plant species. Among the trees found are birch (Betula utilis), Hippophae rhamnoides, willow, poplar and juniper, Myricaria germanica. Among the herbs, Potentilla desertorum, Mertensia tintetica, forbs: Primula macrophylla, Polygonum species, besides shrubs mainly Artemisia species and local grasses & sedges. (WWF/KNP 2004).

The KNP is the only functional park in the Northern Areas with operational capacity as well as active interactions with the local communities. The initial challenge was to reverse the declining number of wildlife species, especially Marco Polo sheep, blue sheep, kiang, snow-leopard, brown-bear and Ibex, which the baseline in 1975 showed numbering only 300, 35, 17, 5, 28 and 395. By 1995, the numbers were almost doubled except for Marco Polo sheep which was reportedly declined from 300 to 52.

“Marco Polo sheep were abundant around Khunjerab Pass until the 1960s, but once construction of the Karakoram Highway began, with its influx of road workers and soldiers, sheep numbers declined steadily. To help save a remnant, Pakistan established the Khunjerab National Park in 1975”. (Schaller, 1987)

Even after the notification of the Park in 1975, there was no management structure on the ground. It was only in 1986 that the Park Directorate was established. During this period the poaching and illegal hunting continued. Besides, opening of the Khunjerab pass for border trade and tourists meant increased travel through the park area, deployment of security and other agencies in the park area who built their permanent structures against the park laws. Their armed
presence in the park disturbed the wildlife and reportedly led to illegal hunting. This is still a major challenge.

Great challenges were faced vis-à-vis the KNP that ranged from changing peoples traditional mindset of top-down approaches to motivating the communities to reduce their livestock numbers, leave the core area of the park and practice rotational grazing in other pristine areas. After protests, rights activism and court litigations, the Khunjerab villagers Organization (KVO), representative of the respective communities, signed an agreement with the park authorities whereby the government accepted their usufruct rights, provided them 80% share in the park entry fee income, co-opted their nominees for local level employment in the park, and allowed the communities to conserve and initiate community-based trophy hunting in the community controlled areas.

Based upon this understanding, the management plan was developed and is under implementation since 1996. Both the communities and the government are happy with this arrangement.

This experience was gained through trials and errors. There are important lessons:

1. The local people or users of a particular resource or buffer communities are the real owners of the land and the natural resources which they nurture for centuries. Their life and livelihoods depend on the products and service of these resources. They are part of the overall landscape and nature.

2. The communities have traditional, indigenous knowledge about rangeland management, wildlife-livestock conflict, fauna, flora, predators, weather cycles, disaster patterns and history, use rights, social and border conflicts, trans-border relations etc. If communities are excluded, there is a risk to lose important knowledge, wisdom, sources of data and information.

3. Abrupt dislocation or pressurizing people to reduce use of resources without creating alternative means and building the capacity of the community organizations lead to conflicts and wastage of resources and time, and negatively impacts the conservation goal.

4. The IUCN categories of management are tools to adjust to new scientific approaches and methodologies and to fit to the ground realities. Categories could be changed and even within one category a mosaic approach could be adopted.
5. Community participation is not a one-time incentive or a consultation mechanism alone. For genuine participation leads to empowerment of the local people. Protecting people’s rights, providing them with a fair share in benefits and making them part of the decision-making processes and take them on board as equal partners make the communities the champions of conservation and they can manage the protected area at much less cost to the exchequer then the departments. In the long run it may results into conservation, sustainability, transparency and effectiveness.

3.3 Case study: Big Pamir Willife Reserve Wakhan, Afgahnistan

The Wakhan strip is around 350 kilometers long. Administratively it is a woluswali (district) (Felmy and Kreutzmann 2004) within the Badakhshan Province of Afghanistan and is bordered with the Gorno-Badakhsan Autonomous Oblast of Tajikistan, Tashkurghan County of China, and the Northern Areas and Chitral of Pakistan. Wakhan has several peaks including Afghanistan’s highest peak, Nawshokh (7,492 meters), and numerous virgin peaks.

The Big Pamir Wildlife Reserve (BPWR) is in Afghan Wakhan and was designated as a royal hunting reserve by the former King, Zahir Shah, in the 1960s. The reserve is the upper section of the Istimoch (Tulibai) Valley. In 1968, for the first time, an outfitter was given permission to hunt in the area. Later, the Afghan Tourism Organization (ATO), was created to operate a trophy-hunting program (Petocz 1978), which expanded the reserve in the 1970s to additionally include Sargaz, Manjulak and Abakhan (Mock and O’Neill 2006).
The reserve is home to the Marco Polo sheep as well as ibex, urial, snow-leopard, brown bear, lynx, wolf, and fox, the long tailed marmot (*Marmota caudata*), various wildcats, martens, weasels, otters, hares and small rodents (UNEP, 2003).

The Big Pamir comprises the main block of mountains at the western end of the Pamir Knot between the fork of the Pamir and Wakhan rivers and plateau of about 4,500 sq km, about 100 km from east to west and between 20 and 60 km broad from north to south between the valleys of the Pamir and Wakhan rivers (UNEP, 2003).

The Wakhi herding community are settled and grazing in the north-western and southern slopes of these valleys, while the north-eastern section of the reserve is inhabited by yurt-dwelling Kirghiz nomads tending their flocks of sheep and goats as well as cattle, yaks, horses, and Bactrian camels (Felmy and Kreutzmann 2004; Sharani 2002).

After the Soviet invasion of Afghanistan, the trophy hunting was suspended. During the Soviet period, the wildlife protection was considered good, as people were not allowed to carry guns and the Soviet army was disciplined. However, after the withdrawal and during the civil war, ibex and Marco Polo sheep become the only food sources for the Mujahideen.
Major issues and challenges are anthropogenic; livestock predation, retaliation, wildlife trade and over grazing of rangelands are common. There is no enforcement mechanism and capacity on ground and there is free grazing and poaching in the reserve. During the drought in Afghanistan, much of the rangelands and wetlands also suffered.

Currently, WCS Afghanistan is implementing a USAID funded project in Wakhan, which involves surveys and analysis of collected data regarding wildlife, rangelands, livestock, forest cover, health, socioeconomic factors and identify threats. Secondly, the project is also focusing community-based initiatives, ranging from environmental education to community mobilization, training in wildlife management, monitoring and ecotourism. Third, WCS is working with the Afghan government to review existing policies and laws for protected area management in the country and proposing a management system for Wakhan. Fourthly, WCS is also working on the concept of four country trans-boundary cooperation (WCS 2007. www.wcs.org/afghanistan).
3.4 Case study: Tajik National Park, GBAO, Tajikistan

The Tajik National Park (TNP – see purple marked area in diagram below) was established in 1992. The park area is spread over 1.6 million ha with the average elevation from 1400–7495 meters above sea level.

The park lies in central and eastern Tajikistan within the Pamirs and Tian-Shan mountains. It entails giant mountains, high peaks and long glaciers including the famous Fedchenko glacier (area 907 km², length 77 km), highest Samani peak (formerly peak of Communism, height 7495 meters above sea level) and two peaks of above seven thousand meter height that are Lenin (7134 meters) and Korjenevskoi (7105 meters). Furthermore, the deepest Sarezskoe lake (area 86.5 km², depth 495 meters, altitude 3239 meters above sea level), is also within the TNP boundaries.

The biodiversity resources are also rich here. More than 2,000 species of vascular plants, including 160 endemic. Rare and endangered species of plants are registered on the park’s territory. Local fauna is also rich and diverse including...

The official objectives of the Park focus on three areas: conservation, economic development and research on natural resources.

**Table 2: Population Density of Main Species in Different Census Areas of Pamir (2002)**

<table>
<thead>
<tr>
<th>Species</th>
<th>Number (last census – 2002)</th>
<th>Density per 1000 ha oh habitats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pamir Argali</td>
<td>5773</td>
<td>3.99</td>
</tr>
<tr>
<td>Snow leopard</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Brown bear</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Siberian ibex</td>
<td>1411</td>
<td>0.84</td>
</tr>
<tr>
<td>Red marmot</td>
<td>3317</td>
<td>41.3</td>
</tr>
<tr>
<td>Tolai hare</td>
<td>87</td>
<td>1.1</td>
</tr>
<tr>
<td>Wolf</td>
<td>17</td>
<td>0.01</td>
</tr>
<tr>
<td>Fox</td>
<td>27</td>
<td>0.016</td>
</tr>
<tr>
<td>Partridge</td>
<td>42</td>
<td>0.55</td>
</tr>
<tr>
<td>Himalayan snowcock</td>
<td>241</td>
<td>2.9</td>
</tr>
<tr>
<td>Ducks of all species</td>
<td>158</td>
<td>1.96</td>
</tr>
<tr>
<td>Rock pigeon</td>
<td>98</td>
<td>1.4</td>
</tr>
<tr>
<td>Eastern rock pigeon</td>
<td>30</td>
<td>0.37</td>
</tr>
</tbody>
</table>

Source: FAO, 2006
Major issues and challenges are human-wildlife conflict, competition for grazing lands, predation, and retaliation. The demarcation of the border is still in development. There are a number of agencies involved in the park area creating stress for park managers.

There is no proper survey of the wildlife resources, especially the argali sheep. For example, the Red Book of Tajikistan describes: argali is endangered species and hunting is banned. However trophy hunting continues for the last 10–15 years (FAO 2006).

There is still little thinking on how to achieve the conservation, economic development and research objectives of the Park. A proper survey, development of a participatory management planning processes and tools need to be developed by involving all stakeholders. A zoning system should be adopted to allow the local communities and government to benefit from the resources and participate in research and conservation work.

4 Conclusion and the Way Ahead

The four cases show that creating a protected area was easier then managing it. The following conclusions can be drawn:

– All the four cases are having similar kind of biological resources, pressures and stresses. Various governments have adopted similar management systems be it a reserve or a national park. However, despite the fact that the parks boundaries meet, neither exchange or experience sharing happened nor any expertise or resources have been shared. What could be the hindrances in this regard? In some cases, there seem conflicts; in other instances like Pakistan and China, there are friendly relations and through both the parks, trade and travel is taking place.

– Accessibility is one key issue. As the decision makers are away from the mountain areas and even the Park managers are based almost 500 km away from the Park, they are not accessible to each other.

– Though there is illegal trade in wildlife, wildlife migration between borders, no formal mechanisms are in place to meet and create interdependencies.

– There is a need to create manager-to-manager and community to community contacts/interactions between the parks and protected areas.
– Online forums need to be created to share experiences, tools, methodologies and discuss strategies for joint action.

– Exchange visits of officials, project staff and communities will help promote understanding and develop cooperation.

– Policy-makers should be involved in deliberations at the local, provincial and national levels.

– The security and other agencies working in the park areas should be sensitized on conservation ethics, principles etc. and they should be trained in wildlife survey methods, as they are based in the area with huge resources and could be beneficial for conservation.

– An integrated, holistic and landscape approach should be adopted linking conservation with broader sustainable development goals and livelihood needs of the local people both at the local and in the transboundary context.

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5 Regional Cooperation and Economic Exchange Relations

5.1 Cross-Border Value Chains and Competitive Advantages for Mountain Areas

Muzaffar ud Din

1 Introduction

This paper aims to apply the ‘concept of “value chain development approach” in a dual way. First, to understand the existing phenomenon, secondly, to propose a framework to promote economic development in mountain societies. In particular, it attempts to focus the concept on opportunities that exist in a cross border space.

2 The Context of Globalization and Effect on Cross Border Cooperation

Globalization has raised many important challenges and is high in policy agenda of many countries. The acceleration of globalization is linked to the rapid emergence of “Global Value Chain” (OECD 2007) which is part of a production chain and a spatially spread division of labour as well. The whole process of producing goods from raw materials to finished goods/products has increasingly been “sliced” and each process could be carried out everywhere (Uiboupin 2007). The necessary skills and services are available at lower cost at different places and

12 Regional Programme Manager (RPM),/ Programme Manager Enterprise Development, Aga Khan Rural Support Programme, Gilgit, Northern Areas of Pakistan
need to be connected in order to achieve a value chain with marketable products. This global value chain phenomenon, though, has positively affected many parts of the world to a certain degree, but some areas like mountain regions have not been part of allocating greater benefits.

Like other parts of the world, the mountain societies including the Northern Areas of Pakistan are also witnessing major changes. The changes in the Northern Areas are both geographical and demographical. The centuries-old and long isolation and remoteness, that had shaped a peculiar socioeconomic condition, is fading away, and new opportunities are emerging (Wood, Malik & Sagheer 2006). The mountain communities are experiencing increased interactions (cultural, business, politcal and the like) at inter and intra valley levels as well as beyond the political borders. On the other, the phenomenon of having access and increased exposure to the outside world has also led the mountain region towards global exploitations.

These mountain ranges, once considered as the barriers for trade and commerce among the countries sharing a watershed or connecting passes are now emerging as trade junctions and resource-bases for economic development, i.e. in hydro-energy, minerals, water etc. Macro-development initiatives, like trans-mountain communication networks, construction of high dams and hydro-electric power units and mining explorations have brought greater development opportunities to these mountain regions and have increased global business interests. Once isolated and limited production cycles and localized services systems have now been affected by supply and demand changes at the global level. However, exposure to these increased global value chain has resulted in policy challenges related to income and growth disparities in and around the mountain areas, threat to the fragile mountain eco-system and most importantly affected the livelihood of the people living in and around this mountain region.

3 Economic Change in the Mountain Areas

The mountain societies are going through major transformations, from change in livelihood patterns at household level to macro-level investments in social and development sectors (cf. Kreutzmann 2006a, b). These changes in the mountain regions reveal a highly diversified pattern, thus widening the gap between mountain regions. Certain sectors dominate in specific regions. Traditional methods used for rural uplift and economic development such as the increase in production or improving services and competitiveness through cooperative efforts have
shown their impact at the livelihood level. Generally speaking, these initiatives remain isolated and peripheral.

The rapid pace of globalization, mainly fueled by the technical advancement in transport and communication, resulted in lowering the transfer cost of both goods and services to other countries (Rodnur 2007)). For example, the opening up of border-trade between China and Pakistan has benefited the isolated mountain communities in terms of access to affordable goods and opportunities in employment and small businesses. However, these macro-level, cross-border and trans-mountain initiatives need to be analysed carefully. The required perspective and assessment needs to be based on the prospect of how much of the gain is retained in the mountain areas.

Table 1 above presents a comparative picture of the volume and value of the exports and imports for Pakistan with China. Though the trend has been erratic over the last five years, the table clearly shows that there are major imbalances between the levels of exports and imports. With Pakistan heavily involved in importing goods, figures show a significant trade surplus in favour of China. From the local economic development perspective, the existing export patterns do not bring major gains to the mountain region as very little if any of those goods exported to China originate from the Northern Areas.
With all these development and improvements noted, the key question is how to transform these local level development and economic gains; like increased production, improved infrastructure, access to social services in conjunction with regional and global initiatives, like border trade, large investment in key infrastructures and industries for a sustainable economic growth, in a more environmentally responsible manner.

4 Value Chain Approach for Cross Border Cooperation

Value chain as understood in this paper is perceived as a framework as well as an operational model. The basic premise of this model is that a product is rarely directly consumed at the place of production. It is multi-locally transformed, combined with other products, transported, packaged displayed etc. Intermediate products and final products are owned by various actors who are linked by trade and services and each add value to the product and service (Morgan 2002).

Hence the globalization does not only patch up market gaps and bring producers and consumers closer together; it also brings regional and international competition into local markets. For instance, any agriculture produce not consumed by the farmers' families is a product in the from market (local to international) and competes today with products coming from nearby or faraway (Roekel et al. 2007). For example, looking into the developing value chain linked to the apricot sector in Northern Pakistan reveals that its linkages with the international market did not only benefit a large number of poor farmers but also has added value at different levels of the supply chain (Wood, Malik & Sagheer 2006), like introducing of new technologies and techniques in fruit drying and introducing standards for dry fruits. Certification like fair-trade and organic production standards did not only expand the market but offered a premium price for all the actors in the value chain. Consequently an additional source of foreign exchange could be generated for a country like Pakistan by uplifting the market value of a traditional surplus product.
Building on the current potential of border-trade between Pakistan and PR of China and the informal barter system across the border with Afghanistan, a value chain framework could add more benefits to local people in terms of both providing services, like storage, transportation, information and even out-sourcing of some production processes.

The model for Value Chain Development in Mountain Areas (cf. Figure 1) primarily aims to perceive a sector or production process more holistically that encompasses all affected actors, potential supporters and effective influencers involved in the chain.

Currently, some of the promising sectors that would offer cross-border cooperation in the mountain areas are: border trade, tourism bio-diversity exchange of knowledge and information water resource and energy.

Figure 1: A model of value chain development for Mountain Areas
Source: Enterprise Development Strategy for Northern Areas; 2004 AKRSP, Gilgit
5 Value Chain a Tool for Greater Local Impact

The benefits of applying this approach are obvious. Gains on the cross-border trades can be retained at local level by systematically envisioning the value chain of the sector and devising proper intervention.

The framework starts from producers to policy and regulation, this includes:

- at producer or consumer level, retention of gains can be increased by adding value through certification as organic products, declaration as fair-trade, exploiting and highlighting ethnicity and instrumentalising local level services like transportation and employment;

- at the provider level specific skills, knowledge centers and information services on market for the sectors can add value to the sectors as well as benefits can be channelled to local economy;

- small enterprises acting like franchises of major producers, out-sourcing of certain production processes are the areas where in the cross-border trade the local mountain community can add value and increase the retention of the benefits from the exchange of trade and services;

- specific market facilities, like dry ports, export processing zone, trade corridors and trade free zones are few key market facilities essential for promoting cross-border trade. Besides, a source of economic development in the border areas; and finally, policy and regulatory framework is the important element in value chain to increase cross-border trade and cooperation. This includes trade policy, border regimes and access and travel policies.

6 Conclusion

The rapid emergence of “Global Value Chain” that encompasses all the sectors and actors of economies and regions has both offered opportunities and also posed challenges. Mountain areas are no more solely exceptional and marginal as they are moving from a peripheral position to the core market place. Trans-border and mountain trade, business and exchange are increasing with better communication facilities. On the contrary, the predominant challenge is how to retain a benefit for the local communities by providing opportunities for value addition and maintaining the fragile but important eco-system of the world. The
The key question is how to transform the borders from a constraint to an economic and development opportunity?

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5.2 Present Situation and Future Potential for Cross-Border Fruit Trade between PR China and Pakistan

Dai Jian\textsuperscript{13} and Lu Zhaohui\textsuperscript{14}

1 Introduction

This paper outlines the present situation of cross-border fruits trade between Xinjiang Uyghur Autonomous Region (XUAR) of China and the Islamic Republic of Pakistan. It also analyzes the different advantages of fruits planting in Xinjiang and Pakistan.

Xinjiang is the only province in China that borders with Pakistan having over 500 km borderline. The Hongqilapu Port in the Tashkurghan Tajik Autonomous County of Kashgar Prefecture of XUAR is located in the Pamir mountain areas. It is the only land port between China and Pakistan. Besides, it is also the only port in Xinjiang for third country trade. Hongqilapu is 1890 kilometers from Urumqi, the capital city of Xinjiang, and 420 kilometers from Kashgar, one of the important cities in the south part of Xinjiang. But Hongqilapu, which is 870 km from the Pakistan’s capital city of Islamabad, is only 130 kilometers from the Silk Route Dry Port, Sost and 270 kilometers from Gilgit, a district and, the central city of in northern part of Pakistan. As a result, due to its special geographic location, Hongqilapu is the most important channel of cross-border fruits trade between Xinjiang and Pakistan.

2 Cross-border fruit trade between Xinjiang and Pakistan

Cross-border trade between Xinjiang and Pakistan has a long history. For the last two decades, as a result of the extension of cross-border highway between the two countries, the cost of transporting goods has gone up significantly and the volume of intra-regional trade increased considerably.

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\textsuperscript{14} Associate Professor, Institute of Agricultural Economy & Information, XAAS
2.1 Present situation of fruits exports from Xinjiang to Pakistan

Currently, fruits are one of the important items being exported from Xinjiang to Pakistan through the Hongqilapu Port. There has been a substantial increase in fruits exports over the past several years, that is from 308 tons in 2002 to 17,362 tons in 2006. (See Table 1)

Table 1: Fruits exports from Xinjiang to Pakistan, 2002–2005

<table>
<thead>
<tr>
<th>Year</th>
<th>Fruits exports ton</th>
<th>Value to thousand Dollars</th>
<th>Exports Growth rate %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Exports (weight)</td>
</tr>
<tr>
<td>2002</td>
<td>308</td>
<td>16</td>
<td>–</td>
</tr>
<tr>
<td>2003</td>
<td>4715</td>
<td>58</td>
<td>1431</td>
</tr>
<tr>
<td>2004</td>
<td>9552</td>
<td>193</td>
<td>103</td>
</tr>
<tr>
<td>2005</td>
<td>17362</td>
<td>501</td>
<td>82</td>
</tr>
</tbody>
</table>

Source: Data from the Xinjiang Customs 2005.

Data in the Table 1 show that the cross-border fruits export between Xinjiang and Pakistan is only at its infant stage. The annual export amount is not so large, but its growth rate is very high. In 2005, there were 693 batches of fruits exported from Xinjiang to Pakistan. The total weight was 17362 tons and the value was 5.01 million US Dollars, which is respectively 82% and 160% higher than that of 2004. Most of the exports are apples, pears and grapes produced in the southern part of XUAR. Respectively, they account for 39.4%, 34.5% and 25.5% of the total fruits export.

2.2 Present situation of fruits exports from Pakistan to Xinjiang

The Gilgit District of the Northern Areas of Pakistan, bordering with XUAR through Hunza valley is a mountain area. Because of the local climatic and geographic conditions, the region can produce only small cherries, mountainous pears and grapes. These fruits are tasty, but the yield is low. As a result, even the local demand is not met, and not to talk of exporting them to other regions and across borders.
3 Potential for cross-border fruit trade between Xinjiang and Pakistan

3.1 Analysis of possible improvement in fruits export from Xinjiang to Pakistan

1. Xinjiang has the most advantageous natural conditions for producing different varieties of fruits. It has a rich sunshine and warm conditions, with dry climate, and also significant temperature differences between day and night in summer. As a result, it is very suitable for growing various temperate fruits of high quality in large quantities. Especially, in Tarim Basin, lying in the southern part of XUAR, the annual sunshine ranges from 2500–3000 hours. The yearly average temperature is 9.8–12.9 degrees; and for 180–220 days in a year, there is no frost. This type of climatic environment provides the best growing conditions for apples, pears, apricots, pomegranates and many other fruit varieties. Now, the local government is establishing a large fruits production base in the Tarim Basin, which will help improve the cross-border fruits’ trade between Xinjiang and Pakistan.

2. Xinjiang also has a number of typical fruits germplasm. This region has a long history of planting fruit trees. It accumulates a large amount of fruit germplasm and local species. Many local varieties, such as fragrant pears from Korla, apples from Aksu, Turpan grapes, muskmelons and dates from Hami, pomegranates and walnuts from Hotan, and figs from Artux, are all famous fruit varieties well-known in China as well as in many parts of the world.

3. Xinjiang’s capacity to produce fruits has been growing. Since 2000, the agricultural structure of Xinjiang has been undergoing regulation. The overall capacity of fruit production, such as the fruit varieties, planting area, yield and quality, has increased quite a lot. It has set up a good foundation for exporting fruits to the nearby Central Asian countries. According to statistics, in 2000–2006, the annual increment in planting area and total yield of fruits are about 15% and 12% respectively. Till 2006, the planting area was 502.8 thousand hectares, while the total yield was 3431.4 thousand tons. In the Kashghar Prefecture, the fruits yield is 237.8 thousand ton and the planting area is 118.4 thousand hectares. It has increased by 289% and 216% respectively as compared to that of 2000. Also, during that period, the planting area and the yield of apples, pears and grapes, which account for a large percentage of cross-border trade between Xinjiang and Pakistan, increased quite a lot. (See Table 2 and Table 3)
The fruits import policies of the Government of Pakistan are loose. Many temperate fruits, such as apples, pears, grapes and melons in the market of the Northern Areas of Pakistan depend highly on imports. The local government makes a lower customs duty for fruits imports in those areas, because local supply is not sufficient to meet the demand. Especially, it provides 24 hours service at the Sost Customs, and there is no import quota. So, at this point, it is not so difficult for the fruits from Xinjiang to go into Pakistan through the Hongqilapu Ports. Resultuntlz, the exports have increased a lot in the past several years.

### Table 2: Data of Planting Area of Typical Fruits in Xinjiang in 2000–2005

<table>
<thead>
<tr>
<th>Type of Fruits</th>
<th>Plant Area</th>
<th>Xinjiang</th>
<th>Southern Xinjiang</th>
<th>Kashgar Prefecture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruits in Total</td>
<td></td>
<td>2000</td>
<td>193075</td>
<td>101081</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2006</td>
<td>502788</td>
<td>347923</td>
</tr>
<tr>
<td></td>
<td>Annual increase rate</td>
<td></td>
<td>14.65</td>
<td>19.31</td>
</tr>
<tr>
<td>Apples</td>
<td>2000</td>
<td>34561</td>
<td>11103</td>
<td>2622</td>
</tr>
<tr>
<td></td>
<td>2006</td>
<td>31067</td>
<td>13522</td>
<td>3486</td>
</tr>
<tr>
<td></td>
<td>Annual increase rate</td>
<td></td>
<td>–</td>
<td>2.86</td>
</tr>
<tr>
<td>Pears</td>
<td>2000</td>
<td>33898</td>
<td>20657</td>
<td>1836</td>
</tr>
<tr>
<td></td>
<td>2006</td>
<td>69180</td>
<td>51277</td>
<td>2039</td>
</tr>
<tr>
<td></td>
<td>Annual increase rate</td>
<td></td>
<td>10.73</td>
<td>13.87</td>
</tr>
<tr>
<td>Grapes</td>
<td>2000</td>
<td>59054</td>
<td>15407</td>
<td>2192</td>
</tr>
<tr>
<td></td>
<td>2006</td>
<td>103875</td>
<td>34590</td>
<td>4225</td>
</tr>
<tr>
<td></td>
<td>Annual increase rate</td>
<td></td>
<td>8.40</td>
<td>12.25</td>
</tr>
</tbody>
</table>

Source: Based on Xinjiang Statistics Yearbook 2001 and 2007
### Table 3: Data of Total Yield of Typical Fruits in Xinjiang in 2000–2005

<table>
<thead>
<tr>
<th>Type of Fruits</th>
<th>Plant Area</th>
<th>Xinjiang</th>
<th>Southern Xinjiang</th>
<th>Kashgar Prefecture</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2000</td>
<td>151,873</td>
<td>66,784</td>
<td>23,784</td>
</tr>
<tr>
<td></td>
<td>2006</td>
<td>343,143</td>
<td>182,127</td>
<td>75,984</td>
</tr>
<tr>
<td>Fruits in Total</td>
<td>Annual increase rate</td>
<td>12.35</td>
<td>15.41</td>
<td>17.85</td>
</tr>
<tr>
<td>Apples</td>
<td>2000</td>
<td>299,673</td>
<td>85,925</td>
<td>23,277</td>
</tr>
<tr>
<td></td>
<td>2006</td>
<td>327,886</td>
<td>128,760</td>
<td>40,269</td>
</tr>
<tr>
<td></td>
<td>Annual increase rate</td>
<td>1.29</td>
<td>5.95</td>
<td>8.14</td>
</tr>
<tr>
<td>Pears</td>
<td>2000</td>
<td>194,879</td>
<td>111,528</td>
<td>22,832</td>
</tr>
<tr>
<td></td>
<td>2006</td>
<td>435,203</td>
<td>264,796</td>
<td>29,182</td>
</tr>
<tr>
<td></td>
<td>Annual increase rate</td>
<td>12.16</td>
<td>13.15</td>
<td>3.57</td>
</tr>
<tr>
<td>Grapes</td>
<td>2000</td>
<td>683,645</td>
<td>167,546</td>
<td>26,789</td>
</tr>
<tr>
<td></td>
<td>2006</td>
<td>1,502,035</td>
<td>352,301</td>
<td>59,233</td>
</tr>
<tr>
<td></td>
<td>Annual increase rate</td>
<td>11.90</td>
<td>11.20</td>
<td>12.00</td>
</tr>
</tbody>
</table>

Source: It is based on Xinjiang Statistics Yearbook 2001 and 2007

### 4 Analysis of potential improvement in fruits exports from Pakistan to Xinjiang

1. The fruits planted in Pakistan are complementary to those planted in Xinjiang. The southern part of Pakistan is the so-called Oriental Fruit Basket. It is famous for its tropical and sub-tropical varieties, such as bananas, oranges, mangoes, palm dates, pineapples, and out of these, oranges and mangoes are two of the major important export fruits of Pakistan. The country is the fifth largest producer of mangoes and the third largest exporter in the world. The present planting area has reached 93 thousand hectares, with the total yield of around 925 thousand tons. The annual export is about 60 thousand tons valued at 24 million US Dollars. The present annual yield of oranges in Pakistan has reached 2500 thousand tons in 2005. It has a rich juice and a sweet-sour taste.
It has also won some approval in the international market, with its low price, high quality, and long shelf-time. Therefore, fruits produced in the southern Pakistan are complementary to those produced in Xinjiang and the other provinces in northern China. As a result, there is a potential for Xinjiang to improve its cross-border trade with Pakistan and take full advantage of the location of the Hongqilapu dry port.

2. In addition, to improve trade between the two countries, a series of bilateral government treaties have been signed in recent years, including the Free Trade and the Early Harvest Agreement. By signing those agreements, the two countries have promised to reduce customs duty on three types of agro-products to zero on the last day of 2005, 2006 and 2007. According to the regulation of the Chinese Customs, 11 kinds of fruits from Pakistan are accorded to those agreements, such as palms, pineapples and the like. So, after the agreements took effect in 2006, the Chinese government permitted to import mangoes and oranges from Pakistan through the only land port in China, i.e. Hongqilapu Port and other six ports of ocean and air transportation located in Dalian, Tianjin, Beijing, Shanghai, Qingdao and Nanjing. Since January 1, 2007, the duty of dry fruits, like dry figs, dry palm dates and dry pineapples, etc, imported into China from those ports have been reduced to zero. Now, in the supermarket and in the fruit wholesale markets of Xinjiang, fruits from Pakistan can also be found. It is expected that such bilateral trade treaties would help to further expand cross-border trade in fruits between Xinjiang and Pakistan.

5 Conclusions

1. Cross-border fruits trade between Xinjiang and Pakistan is currently at its infant stage. But the annual exports have increased a lot in the past several years at a rapid pace.

2. Fruits varieties produced in Xinjiang are highly complementary to those produced in Pakistan. So it is helpful to push cross-border fruits trade.

3. The Hongqilapu Port is the only land port in China that is allowed to import fruits from Pakistan. In future, its role in cross-border fruits trade between the two countries is expected to grow even further.
6 References


5.3 Enabling Conditions for Promoting Regional Economic Cooperation in South Asia

Golam Rasul

Abstract

The concept of regional economic cooperation has slowly gained acceptance in South Asia. South Asian Preferential Trading Arrangement was operationalized in 1995 under SAARC to promote trade and economic integration among SAARC countries. Despite many deficiencies, the South Asian region has been moving towards a more open trade regime. This, however, delivered limited benefits to mountain areas of South Asian Region particularly Nepal, Bhutan and North-East India because of remoteness and isolation. Both Bhutan and Nepal are landlocked countries. Although, they have two-transit neighbors – India and China – but in reality, they have only one transit corridor through India because of difficult mountainous terrain of the Himalayas. Similarly, mountain states of North East India have to face high trade cost for regional and international trade because of national border that constrained them to choose shortest access of seaport. An effective regional cooperation can facilitate better integration and economic prosperity of the mountain areas including two landlocked countries through removing infrastructure and other procedural bottlenecks of trade and regional exchange.

All the countries of South Asian region, except Sri Lanka and Maldives, are located in a single landmass. Although, geographical proximity has made it possible to better economic integration, but the economic integration in the region is low. The question arises why? Based on analysis of relevant information, this paper attempts to answer this question.

The official data show that the volume of intra-regional trade among the SAARC countries is very low, which is only five percent of its total trade. Although, formal trade among the SAARC countries is low, there is huge amount of infor-

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15 Policy Development Specialist, International Centre for Integrated Mountain Development (ICIMOD), Nepal
mal trade. Like trade, intra-regional investment is also very low. On an average intra-regional foreign direct investment (FDI) is less than 1.0% of the total FDI received by South Asia. Despite huge potential, the intra-regional tourism is not developed properly. The contribution of tourism in GDP and employment in SAARC countries is much less in comparison to world average.

The analysis revealed that the weak physical infrastructure, poor transport and communication, tariff and non-tariff barriers and complicated rules and regulations impose huge cost on trade and restrict movement of people. These are largely responsible for low economic integration of the region. Transporting a container from Delhi to Dhaka, for instance, takes 45 days because of lack of railway container. In contrast, the distance of around 2,000 km between Dhaka and Delhi could be covered in two or three days by rail. Similarly, a consignment of cotton takes 40 days to move from West Punjab to Chittagong via Karachi with transshipment in Colombo or Singapore, which could reach Dhaka within 4 days. As there is no transit cooperation between India and Bangladesh, North East India has to incur about 60 percent higher transport cost for exporting goods. Similarly, Nepal and Bhutan has to incur high trade cost to export its goods to Bangladesh because of transshipment at border and lack of adequate logistic facilities.

The transport bottlenecks not only inhibit trade but also inhibit movement of people including inter-regional and international tourists as well as inhibit investment and other economic and social collaboration. Besides poor infrastructure, considerable difficulties exist in administrative rules, regulations and procedures in cross-border trade in South Asian countries and traders have to incur high transaction costs in terms of both money and time. For deeper integration, it is necessary to create enabling condition by expanding transport and communication infrastructure and harmonizing rail and road systems. Accordingly, transit facilities across the territories of member countries and integration of the labor and capital markets is essential. Customs and transit procedures need to be harmonized and simplified. Areas under economic cooperation need to be enhanced through greater cooperation in the use of transborder rivers, investment and trade in hydropower and transportation.

1 Introduction

The world economy is undergoing widespread changes because of liberalization and globalization. To cope with such far-reaching changes, most countries of the world are facing huge challenges. One of the useful ways of meeting these
challenges is to form mutually beneficial economic cooperation between neighboring countries by making the best use of comparative advantages and the complementarities between them. This has resulted in the proliferation of trade blocks or Regional Integration Agreements (RIA) in the world. More than 150 such trade blocks and RIAs have been notified to the World Trade Organization (WTO) (Madawela 2003; WTO, 2003).

The concept of developing geographically and culturally contiguous zones through economic cooperation, which include countries and adjacent parts of countries, has slowly gained acceptance in South Asia. South Asian Preferential Trading Arrangement (SAPTA) was operationalized in 1995 under South Asian Association of Regional Cooperation (SAARC) to promote trade among SAARC countries. In 2004, a framework agreement on South Asian Free Trade Area (SAFTA) was signed among the member countries to promote regional integration. Despite many deficiencies and difficulties, the South Asian region has been moving towards a more open trade regime. Average import tariff in the region has come down from around 47 percent in the late 1980s to 18 percent in 2004. This gradual liberalization and openness; however, delivered limited benefits to mountain areas of South Asian Region particularly Nepal, Bhutan and North-East India because of remoteness, isolation, and high transport cost. Bhutan and Nepal are landlocked countries. Although they have two transit neighbors, India and China, but in reality the practical transit corridors are only through India because of difficult mountainous terrain of the Himalayas (Chowdhury and Erdenebileg, 2006). Similarly, North East mountain states of India are in a disadvantaged position and have to face high transportation cost for regional and international trade because of national border that constrain them to choose shortest access to sea port and major markets of the region, which makes them less competitive in both regional and international trade. An effective regional cooperation can go a long way towards facilitating transit transport of the mountain areas including the two landlocked countries as well as removing infrastructural and other procedural bottlenecks of trade and regional exchange (Sobhan, 1999; Chowdhury and Erdenebileg, 2006).

Geographically, all the countries of South Asian region, except Sri Lanka and Maldives, are located in a single landmass, making the region possible for better economic integration. The countries in South Asian region are not only geographically contiguous but also culturally linked. The people of this region historically belong to similar culture and common heritage. However, the economic integration in the region is low. The question arises why? The objective of this paper is to analyze the bottlenecks of promoting intra-regional trade and
economic integration in South Asia. A more clear understanding of the bottlenecks may help design appropriate policies and strategies to overcome them and create an enabling environment. As political aspects of regional economic cooperation is analyzed nicely by Kreutzmann (2007), Khan et al. (2007) and Taneja (2004), this paper will focus on rules, regulations, tariff and non-tariff barriers, transportation and communication of goods and services and movement of people, which are key for cross-border economic integration. The paper has been organized in six sections. The first section examines the role of economic integration in the context of mountains of South Asia followed by a conceptual framework developed in Section 2. Section 3 briefly examines the present status of economic integration in South Asia followed by examination of factors/conditions constraining the economic integration in Section 4. Section 5 examines the consequences of physical and institutional bottlenecks in cross-border trade and economic integration. Finally, section 6 outlines a framework for creating enabling conditions for promoting trans-border economic cooperation.

2 The Economics of Trans-border Economic Cooperation: A Conceptual Framework

The economic rationale of trans-border economic cooperation under the era of globalization and multilateral trading system has often been raised in the literature on trade and development (Bhagwati, 1992; Irwin, 1993 Winters, 1996; Panagariya, 1999). Broadly, there are two diverging views. The believers of multilateralism argue that regional economic cooperation particularly preferential trading arrangement can lead to ‘trade diversion’ by discrimination against non-member countries which can divert import from low cost foreign suppliers to high cost regional partners and thereby reduce national welfare (Bhagwati and Panagariya, 1996; Bagwell and Staiger, 1998; Panagariya, 1999). Moreover, regional trading arrangements can detract from true liberalization through creating protection against non-member countries and fragment the global trading system, which is quite opposite to economic sense.

On the other hand, the advocates of regional arrangement consider the above argument too narrow to judge the overall benefits of regional economics and put forward numerous arguments in favor of regional economic integration. They argue that regional economic integration not only creates ‘trade diversion’ but also ‘trade creation’ by facilitating cross-border trade and involving small and medium entrepreneurs which can generate welfare gain for all the trading partners. Whether it creates or diversifies trade, it depends on the competition, open-
ness, complementarity, proximity, market size, geographical, and political unity (Viner, 1953; Krugman, 1991; Nitsch 1996; Sobhan, 1999). If regional trading arrangements are formed among natural trading partners, then it creates more trade and bring welfare of member nations through more efficient resource allocation (Wonnacott & Lutz, 1989:69). Trade between geographically contiguous countries have the advantage of lower transaction costs because of proximity of markets, availability of common infrastructure, and such cultural factors as common language, customs and consumption patterns (Wonnacott & Lutz, 1989). Trade between geographically contiguous countries have the advantage of lower transaction costs because of proximity of markets, availability of common infrastructure, and such cultural factors as common language, customs and consumption patterns (Wonnacott & Lutz, 1989). Low transport cost facilitates more trade between such countries and thereby reinforces trade creation rather artificially diverting them (Wonnacott and Wonnacott 1981; Wonnacott & Lutz, 1989 in Panagariya, 1998). Because of this advantage, almost 60 percent of the world trade is presently carried out within regional blocks on a preferential basis (Dubey, 2005).

Besides, cross-border economic cooperation can enhance economies of scale in production through facilitating specialization, reducing monopolies, expanding market and thereby can reduce production cost and enhance welfare of a nation (Corden 1972; Pigato et al, 1997; Madawela, 2003; Dubey, 2005). Economic integration also can enhance the ability of its member countries to better deal with the global system of trade, finance and the ability to cope with the challenges of globalization.

Forming regional economic blocs also increases the potential for more productive use and management of the shared resources like rivers, fishing areas, railways, hydroelectric power facilities, transportation and tourism (Sobhan, 1999; Batra, 2004). The world’s largest hydropower facility, the 12,600 MW Itaipu station, located on the Parana River is operated by both Brazil and Paraguay (Madawela, 2003). At the same time, regional integration can create a better climate for resolving internal differences and enhance mutual trusts for addressing the common problems (Dubey, 2005; Sobhan, 1999).

One may raise question, despite many benefits of regional economic integration, why integration among different regional blocs is slow particularly in SAARC countries, which is geographically contiguous and culturally quite integrated. Scholars (such as Kemal et al, 2002; Panagariya, 2006; Das, 2007) believes in Ricardian comparative advantage that geographical proximity and cultural unity are not the determinant factors of regional integration. Comparative advantage is the primary determinant of regional integration. Low trade complementarity and limited comparative advantage are the primarily factors responsible for low level of economic integration among SAARC countries. A number of scholars
(e.g., Hirantha, 2003; Pitigala, 2005; Sobhan, 2006, Rahmatullah, 2006, Batra, 2006), however, argue that trade complementarity is not enough for deeper economic integration. Physical and institutional condition such as road, transport, communication, rules and regulations that control and regulate movement of cross-border goods, services and people are important for deeper economic integration. Despite high complementarity, trade may not happen due to unfavorable physical and institutional environment. Again deeper integration may happen with limited complementarity due to better environment as in Western Europe. The differences in transport costs can also affect the volume and composition of trade (WTO, 2004). Trade complementarity is, therefore, not only a determinant of economic integration but trade facilities including physical and institutional conditions particularly trade costs are important determinants of cross-border economic integration.

3 Status of Economic Integration under SAARC

Before going to examining the factors constraining economic integration, it is useful to look at the current status of the level of economic integration in South Asia. Seven South Asian countries (Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka) formed the SAARC in 1985 to promote active cooperation in the economic, social, cultural, technical and scientific fields to improve their quality of life through accelerated economic growth and poverty reduction. After a decade, the SAPTA was launched by the SAARC in 1995 to promote preferential trade within the region. It took another nine years to move from SAPTA to SAFTA, when a Framework Agreement on SAFTA was signed at the Islamabad SAARC Summit in April 2004. The signing of this agreement has imparted a major thrust to the movement for regional integration in South Asia. This section briefly analyzes the status of regional economic integration particularly in areas of trade, investment and tourism.

3.1 Status of Trade

The volume of trade among the SAARC countries is very low (Table 1). Total trade among SAARC countries is just over 10 billion US dollar which is only five percent of its total trade. Although total inter-regional trade is low, landlocked mountain countries such as Bhutan and Nepal have significant inter-regional trade, 85 and 53 percent respectively. Due to the landlocked nature of these two countries, trade takes place primarily with India. Bangladesh, Sri Lanka and Maldives and
the inter-regional trade has considerable amount. One-fifth of Bangladesh import comes from SAARC countries although its export to SAARC countries is insignificant, less than two percent. Maldives and Sri Lanka also import from SAARC region. However, trade between the two largest economies in the region, India and Pakistan, remains very low. India’s import from the region is less than one percent and export less than seven percent. Pakistan’s trade within the region is around three percent (Table 1). Frankel and Wei (1995) estimate that the trade between India and Pakistan is 70 percent lower than that of two similar economies in such a geographical proximity. They behave against the natural block and their trading patterns show ‘inverse regionalism’ as called by Lahiri (1998).
Table 1: Intra-regional imports and exports of South Asian Countries in 2003 (in million US$)

<table>
<thead>
<tr>
<th>Reporting Country</th>
<th>Bangladesh</th>
<th>Bhutan</th>
<th>India</th>
<th>Maldives</th>
<th>Nepal</th>
<th>Pakistan</th>
<th>Sri Lanka</th>
<th>Total (SAARC)</th>
<th>World</th>
<th>Intra-regional import/export as world trade of SAARC countries, %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Imports</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bangladesh</td>
<td>–</td>
<td>2.7</td>
<td>1349.4</td>
<td>0.9</td>
<td>5.5</td>
<td>68.4</td>
<td>7.9</td>
<td>1435.0</td>
<td>7069.5</td>
<td>20.3</td>
</tr>
<tr>
<td>Bhutan</td>
<td>o</td>
<td>–</td>
<td>288.3</td>
<td>3.4</td>
<td></td>
<td></td>
<td></td>
<td>291.7</td>
<td>386</td>
<td>75.4</td>
</tr>
<tr>
<td>India</td>
<td>76.7</td>
<td>51.7</td>
<td>–</td>
<td>0.4</td>
<td>282.6</td>
<td>56.9</td>
<td>192.4</td>
<td>660.7</td>
<td>77201.3</td>
<td>0.8</td>
</tr>
<tr>
<td>Maldives</td>
<td>o</td>
<td>o</td>
<td>47.6</td>
<td>–</td>
<td>1.7</td>
<td>64.6</td>
<td>113.9</td>
<td>470.8</td>
<td></td>
<td>24.2</td>
</tr>
<tr>
<td>Nepal</td>
<td>4.8</td>
<td>0.6</td>
<td>954.9</td>
<td>n.a.</td>
<td>–</td>
<td>3.3</td>
<td>1.9</td>
<td>965.6</td>
<td>1801.6</td>
<td>53.6</td>
</tr>
<tr>
<td>Pakistan</td>
<td>45.8</td>
<td>0.1</td>
<td>381.1</td>
<td>0.2</td>
<td>3.4</td>
<td>–</td>
<td>48.2</td>
<td>478.9</td>
<td>15549.4</td>
<td>3.1</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>5.6</td>
<td>o</td>
<td>1076.4</td>
<td>22.6</td>
<td>70.9</td>
<td>–</td>
<td>1175.7</td>
<td>6514.2</td>
<td></td>
<td>18</td>
</tr>
<tr>
<td><strong>Exports</strong></td>
<td>o</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>o</td>
<td>1.6</td>
<td>47.1</td>
<td>o</td>
<td>3.3</td>
<td>32.7</td>
<td>3.3</td>
<td>87.9</td>
<td>4787.8</td>
<td>1.8</td>
</tr>
<tr>
<td>Bhutan</td>
<td>10.83</td>
<td>–</td>
<td>2435</td>
<td>1.8</td>
<td></td>
<td></td>
<td></td>
<td>256.1</td>
<td>258</td>
<td>97</td>
</tr>
<tr>
<td>India</td>
<td>1719.2</td>
<td>88.4</td>
<td>–</td>
<td>41.7</td>
<td>660.9</td>
<td>283.4</td>
<td>1302.8</td>
<td>4096.5</td>
<td>63028.8</td>
<td>6.5</td>
</tr>
<tr>
<td>Maldives</td>
<td>o</td>
<td>o</td>
<td>0.3</td>
<td>–</td>
<td>o</td>
<td>0</td>
<td>15.3</td>
<td>15.7</td>
<td>112.9</td>
<td>13.9</td>
</tr>
<tr>
<td>Nepal</td>
<td>6.1</td>
<td>1.4</td>
<td>341.8</td>
<td>n.a.</td>
<td>–</td>
<td>0.9</td>
<td>1.2</td>
<td>351.4</td>
<td>652.7</td>
<td>53.8</td>
</tr>
<tr>
<td>Pakistan</td>
<td>194.4</td>
<td>0.4</td>
<td>94.8</td>
<td>1.9</td>
<td>4.6</td>
<td>–</td>
<td>97.6</td>
<td>394.8</td>
<td>1269.1</td>
<td>3.1</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>10.4</td>
<td>o</td>
<td>241.1</td>
<td>54.2</td>
<td>1.6</td>
<td>36.1</td>
<td>–</td>
<td>343.6</td>
<td>4867.8</td>
<td>7.0</td>
</tr>
<tr>
<td><strong>Total trade</strong></td>
<td>10197.8</td>
<td>183969.9</td>
<td>5.56</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Note: Data for Bhutan is from World Trade Organization for 2005.
The volume of intra-regional trade of SAARC as a percentage of its total trade with the rest of the world is probably one of the lowest among the regional groupings in the world. While Intra-EU trade is 64.5 percent (Ahn and Cheong, 2007), intra-NFTA 45.8 percent (Ahn and Cheong, 2007), intra-ASEAN trade is 22 percent (Khan et al., 2007), intra-SAARC trade is only five percent. The scholars believe that poor infrastructure, low connectivity and transport facilities, cumbersome procedures combined with structure of the economies offer limited areas of trade complementarities, and are primarily responsible for low trade among the SAARC countries. With the exception of India, South Asian economies are largely agriculture-based with a small industrial sector. Manufacturing, particularly machinery and equipment sector, is very narrow. While trade complementarities in other regions have grown based on manufactured goods, this has not occurred in South Asia due to the small size of the manufacturing sector and the limited range of goods produced. The low volume of intra-regional trade that is taking place is based largely on agricultural products, which are produced in some countries and not in others. Although SAARC countries have diversified their exports, they are still geared towards markets outside the region, where they compete with one another’s products. As a result, most of the SAARC countries depend on markets outside the region for their exports and high-tech imports. Low growth and demand in the region itself, abetted by historical trade links with the developed countries, have resulted in extra-regional trade patterns. The low per capita income level also constrains potential for intra-industry trade, generally associated with higher income countries.

Trade among the SAARC members, however, has been growing albeit slowly (Table 3). The data show formal trade. Besides formal trade, there is huge amount of informal trade. This amounts to three billion dollar trade among the SAARC countries (Taneja, 2004). The informal trade between India and Pakistan alone is two billion dollar. A large part of informal trade takes place through third countries as only a limited number of items are permitted to be imported to Pakistan from India. Thus, goods move officially from India to Dubai, where the certificate of origin is changed to countries other than India. These goods are then shipped to Bandar Abbas in Iran from where the goods are moved informally by land across Afghanistan into Pakistan. A smaller amount is traded by the sea route to Karachi via Dubai. Informal trade between India and other countries is also huge (Khan et al., 2007). Although there is no accurate statistics, anecdotal estimates, however, suggest that the volume of informal trade might be as high as formal trade.
Informal trade along the landroute is the least and is carried out through the Amritsar-Lahore and Sind-cross border routes. Frankel and Wei (1995) rightly mentioned that the trade between India and Pakistan is 70 percent lower than that of two similar economies and they are behaving against the natural block and their trading pattern shows what is called ‘inverse regionalism’ (Lahiri, 1998).

Recent studies (Khan and Khan, 2003; Burki 2004; Nisha, T., 2004a) suggest that there are significant potential for promoting cross-border trade in South Asia. Given the high growth of manufacturing and high-tech capital machinery sector in certain countries of South Asia particularly India (Tanjeja, 2006). The high informal trade calls for taking measures to recognize and formalize the informal trade and economic activities. Due to lack of facilities for formal trade, informal trade is going on and society has to bear the additional cost.

Table 2: Trend of intra-region trade among SAARC member countries

<table>
<thead>
<tr>
<th>Year</th>
<th>Intra-SAARC Trade, US$ million</th>
<th>World Trade of SAARC Countries, US$ million</th>
<th>Share of Intra-SAARC Trade in World Trade of SAARC Countries, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>1,210</td>
<td>37,885</td>
<td>3.2</td>
</tr>
<tr>
<td>1985</td>
<td>1,054</td>
<td>44,041</td>
<td>2.4</td>
</tr>
<tr>
<td>1990</td>
<td>1,584</td>
<td>65,041</td>
<td>2.4</td>
</tr>
<tr>
<td>1995</td>
<td>4,228</td>
<td>104,159</td>
<td>4.1</td>
</tr>
<tr>
<td>1996</td>
<td>4,914</td>
<td>111,479</td>
<td>4.4</td>
</tr>
<tr>
<td>1997</td>
<td>4,390</td>
<td>115,961</td>
<td>3.8</td>
</tr>
<tr>
<td>1998</td>
<td>6,073</td>
<td>121,331</td>
<td>5.0</td>
</tr>
<tr>
<td>1999</td>
<td>5,640</td>
<td>129,738</td>
<td>4.4</td>
</tr>
<tr>
<td>2000</td>
<td>5,884</td>
<td>141,978</td>
<td>4.1</td>
</tr>
<tr>
<td>2003</td>
<td>10,120</td>
<td>194,752</td>
<td>5.2</td>
</tr>
</tbody>
</table>

3.2 Status of Investment

Investment plays a central role in economic growth, employment generation and poverty reduction. This sub-section deals with investment in the context of regional economic cooperation. However, low savings and capital formation constrain the investment needs for the desired economic growth in South Asia. Savings-investment gap is high in all South Asian countries. It varies from two percent in India to 10 percent in Nepal. In many Asian countries, such as Malaysia, Indonesia and Singapore, savings are higher than the investment requirement and thereby saving-investment gap is positive (Sobhan, 2004:79).

Low level of domestic savings leads low level of investment. One way to meet the savings-investment gap is Foreign Direct Investment (FDI). But, unfortunately, FDI is also low in South Asian countries. Except Maldives and Sri Lanka, per capita FDI is less than US$ 6 and FDI–GDP ratio is less than one percent in most of the countries. Distribution of FDI is also highly uneven. Two-third of FDI is concentrated in India and one-tenth in Pakistan. In small economies like Bhutan, Maldives and Nepal, FDI inflow is just around 10 million dollar per year (Table 3). Although, recently, flow of FDI to South Asia has increased slightly from 1.7 billion from mid-nineties to 9 billion dollar in 2004; but it is just one percent of global FDI and less than five percent of total flow of FDI to Asia.

South Asia not only received very low level of FDI but its intra-regional investment is also very insignificant. Table 4 shows intra-regional FDI flow in South Asian countries. Except Nepal (51%), share of intra-regional FDI is insignificant ranging from 0.04 in India to 4.0 percent in Bangladesh. On an average intra-regional FDI is less than 1.0 percent of the total FDI received by South Asia.

Although, intra-regional investment, is very low, some of the countries of South Asia particularly, India is investing outside the region. For example, in 2004 India made more than US$ two billion investment outside South Asia (for details please see Regional Cooperation in South Asia, 2006:266). It is, therefore, critical for SAARC member countries to improve the climate of intra-regional investment. Regional cooperation initiatives providing preferential treatment to members have been largely confined to trade and have not extended to investment.
Table 3: Foreign Direct Investment Inflows in South Asia (in million US $)

<table>
<thead>
<tr>
<th>Countries</th>
<th>1991–96</th>
<th>2004</th>
<th>Per Capita (US$) FDI</th>
<th>FDI-GDP Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>8.0</td>
<td>460.0</td>
<td>3.3</td>
<td>0.8</td>
</tr>
<tr>
<td>Bhutan</td>
<td>1.0</td>
<td>1.0</td>
<td>0.4</td>
<td>0.1</td>
</tr>
<tr>
<td>India</td>
<td>1085.0</td>
<td>5335.0</td>
<td>4.9</td>
<td>0.8</td>
</tr>
<tr>
<td>Maldives</td>
<td>8.0</td>
<td>13.0</td>
<td>44.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Nepal</td>
<td>8.0</td>
<td>10.0</td>
<td>0.4</td>
<td>0.1</td>
</tr>
<tr>
<td>Pakistan</td>
<td>501.0</td>
<td>952.0</td>
<td>6.0</td>
<td>1.1</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>125.0</td>
<td>233.0</td>
<td>12.1</td>
<td>1.1</td>
</tr>
<tr>
<td>South Asia</td>
<td>1736.0</td>
<td>9008.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent of Southeast Asia</td>
<td>4.8</td>
<td>27.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent of Asia</td>
<td>2.9</td>
<td>4.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent of world</td>
<td>0.7</td>
<td>1.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Moazzem 2006: 264

Table 4: Intra-regional FDI in South Asian Countries (in million US$)

<table>
<thead>
<tr>
<th>Sources of FDI</th>
<th>India</th>
<th>Pakistan</th>
<th>Sri Lanka</th>
<th>Bangladesh</th>
<th>Nepal</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>–</td>
<td>n.a</td>
<td>6.0 (2.6 %)</td>
<td>6.8 (15 %)</td>
<td>5.1 (51 %)</td>
<td>17.9</td>
</tr>
<tr>
<td>Pakistan</td>
<td>n.a</td>
<td>–</td>
<td>0.6%</td>
<td>3.7 (0.82%)</td>
<td>0.03 %</td>
<td>3.7</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>0.01 %</td>
<td>n.a</td>
<td>–</td>
<td>3.45 (0.75%)</td>
<td>n.a</td>
<td>3.45</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>0.6 (0.01%)</td>
<td>0.8 (0.08%)</td>
<td>0.4 (0.18%)</td>
<td>–</td>
<td>n.a.</td>
<td>1.8</td>
</tr>
</tbody>
</table>

Source: Moazzem 2006: 267

Note: % indicate share of total FDI inflow
3.3 Status of Tourism

Tourism development within South Asia can bring economic, social and cultural benefits. Tourism is not only a source of foreign exchange earnings but can also generate employment for the people of the region, which is critically important for all countries of South Asia. The centuries old civilization, rich and unique cultural diversity, extremely diverse and vast array of geography, the great Himalayas, the Karakorum, the Hindu-kush mountains, splendid archaeological monuments, historic sites of religious significance and above all very hospitable people of South Asia can make the region a very attractive place for intra-regional as well as international tourist. However, despite its huge potential, the contribution of tourism both in terms of contribution to GDP and employment in SAARC countries is much less in comparison to the world average (Table 5). A country like Nepal, where the great Mount Everest is located, is also behind in tourism. In India, contribution of tourism to GDP is just half of the world average and in Bangladesh it is just one-third (Table 5).

Table 5: Contribution of tourism industry in South Asia

<table>
<thead>
<tr>
<th>Country</th>
<th>Contribution of tourism industry in GDP</th>
<th>in employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>3.9</td>
<td>3.1</td>
</tr>
<tr>
<td>India</td>
<td>6.1</td>
<td>5.4</td>
</tr>
<tr>
<td>Nepal</td>
<td>6.8</td>
<td>5.8</td>
</tr>
<tr>
<td>Pakistan</td>
<td>6.1</td>
<td>5.0</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>8.4</td>
<td>6.9</td>
</tr>
<tr>
<td>World</td>
<td>9.9</td>
<td>9.2</td>
</tr>
</tbody>
</table>


There is enormous potential for tourism in the SAARC region. Realizing the importance of more cooperation amongst the SAARC member countries in tourism, SAARC leaders have emphasized on the need to take measures for promoting tourism in the region and 2005 was designated as “South Asia Tourism
Despite recognition of importance of regional cooperation, in promoting intra-regional as well as international tourism, joint measures towards this ends is yet to be materialized. Poor connectivity (road, air and water) among the SARRC countries combined with weak infrastructure and cumbersome procedures in visa and other travel logistics have hindered the promotion of tourism in South Asia.

4 Physical and institutional bottlenecks in cross-border exchange

The question arises as to why regional economic integration is so low in South Asia while it has been flourishing in many parts of the world. Conventional explanation, which considers low trade complementarity as a major reason for low economic integration among South Asian countries, does not seem plausible explanation. Had been trade complementarity is the only reason for economic integration, trade between European Union (EU) countries could not be so high. Although, West European countries with almost similar economic endowment, intra-regional trade among EU countries is 62 percent (Spachis, 2004). Experiences from EU and other regional economic arrangements suggest that trade complementarity is not the sole determinant of economic integration. It is important to understand the conditions that are constraining the promotion of trans-border economic cooperation in South Asia with a view to facilitate trans-border economic cooperation. In view of this, this section focuses on the factors constraining cross-border regional economic cooperation. As transportation and communication is critical for trans-border regional trade, focus should be on regional infrastructure and transport network, tariff and non-tariff barriers and administrative rules regulations that govern the movement of goods, services and people.

4.1 Poor transport and communication infrastructure

Transport cost is a significant determinant of trade competitiveness (De, 2007). The main advantage of regional trading arrangements is relatively low trade cost, the proportion of transport and insurance costs to the total volume of export. Generally, proximity and contiguity, which make surface transportation possible, help efficient movement of goods and services that reduces trade cost and increase trade competitiveness. Nevertheless, for various historical, political and economic reasons, surface transport in South Asia has remained fragmented. The present state of these transport conditions is briefly presented below.
4.1.1 Poor Rail Connectivity

Among the countries of South Asia, Bangladesh, India and Pakistan have extensive rail networks within their respective countries. Nepal has 59 km of rails; while Bhutan has no rail network. Before partition of India in 1947, the major intra sub-continental movements of goods and services used to be carried out mainly by railway. Although, these physical links are still there, very little cross-border movement by rail is taking place today between India and Bangladesh and almost no movement between India and Pakistan (Rahmatullah, 2006) for different reasons, explained later.

Between India and Bangladesh, the broad gauge connection is through Gede (India)-Darsana (Bangladesh), and the other meter gauge connection is through Mahishasan (India)-Shahbazpur (Bangladesh), which used to provide the main rail connection between North East India and Bangladesh. Nevertheless, this route has not been in use after separation of India.

No container trains run between India and Pakistan, and between India and Bangladesh. It takes 45 days to transport a container from Delhi to Dhaka; as the container first moves to Tughlakabad ICD in New Delhi, then to Mumbai (India) and Singapore. From Singapore, the container is moved by feedership to Chittagong port, and then to Dhaka by rail despite the fact that, the 2,000 km distance of around between Dhaka and Delhi could have been covered in two to three days by rail (Subramanin and Arnold, 2001:20). Between India and Pakistan rail connection disrupted since 1965, following 1965 Pakistan-India war, which made the cross-border trade difficult.

Due to incompatibility of railway system between India and Nepal, cross-border transit to the sea port at Kolkata takes place mainly by road (Chowdhury and Erdenebileg 2006). Although, movement of cargo through rail could be cheaper and there is compatible railway between Bangladesh and Nepal for cargo movement to Mongla port, Khulna, Bangladesh, using Kathihar-Smghabad and Rohanpur railway line, but this alternative could not be utilized due to lack of agreement among Nepal, India and Bangladesh to allow Nepalese third country trade to go through Bangladesh. As a result, Nepal has to incur relatively high freight cost due to congestion in Kolkata port (Faye et al., 2007).

4.1.2 Poor Road Connectivity

In South Asia, road transport is the dominant mode and its importance is growing in all countries. Most of the trade between India and its neighboring coun-
tries of Bangladesh, Bhutan and Nepal takes place along the landroutes. The border between India and Bangladesh has ten road-based checkposts. However, all freight traffic by road to and from Bangladesh need transshipment at the border as trucks from other countries are not allowed to travel on the road networks of Bangladesh due to differences in the axle load limit (Subramanin and Arnold, 2001). Similarly, India does not allow Bangladeshi trucks to travel to India (Rahamtullah, 2006).

Poor transportation and communication imposes direct costs on cross-trade and thus limits the ability of landlocked country products to compete in global markets. For example, the southern border of Tripura is only 75 km from Chittagong port. But because access for Indian goods is not allowed at Chittagong port, goods from Agartala have to cross 1,645 km to reach Kolkata. If transits were allowed through Bangladesh, and Indian goods were allowed through Chittagong port (which was the traditional route), the journey to port of Assam tea, for example, would be 60 percent shorter (Subramanin and Arnold, 2001:20).

This transshipment, however, incur additional trade cost. For instance, a truck from Kathmandu to Dhaka, a distance of 1,194 kilometers, requires four to five days due to transshipment and delay in customs procedures (Subramanin and Arnold, 2001). Transferring cargo at border not only requires additional time and money but also cause damage of goods.

The trade agreement between India and Nepal has a list of 22 border posts for the movement of goods between the two countries, out of which 15 are authorized for transit traffic (ADB, 2006). Out of these, only six are consistently being used as low traffic because India’s territory is limited to fixed hours of the day. India allows “Kakarvitta (Nepal)-Panitanki (India)-Fulbari (India)-Banglabandha (Bangladesh)” corridor for only bilateral trade between Nepal and Bangladesh. Currently, the level of traffic in this route is very low (less than four trucks per weak) as third country trade is not allowed through this route (Rahmatullah, 2006).

Bhutan’s northern border is with China and the rest of the country is surrounded by India. Three north-south links connect Bhutan to its border with India, connected by a lateral road running roughly east to west in the middle of the country. Roads are in good condition, but their narrowness and winding nature do not allow high speeds or axle loads. As a result, goods are normally transported within the country by trucks with capacities below 10 tons, which incur additional costs.
India allows trucks from Nepal and Bhutan to operate on designated transit routes within India. However, Nepalese truck needs permit for every trip to India with a validity of three months, which incur additional time and cost. India permitted Bhutan to use Phuntsholing (Bhutan)-Changrabandha (India) Burimari (Bangladesh) for its trade with Bangladesh. However, this corridor is not allowed for third country trade, although Bhutanese third country trade faces congestion problems at Kolkata port.

No goods movement by road is allowed between India and Pakistan. Cross-border bus services between India and Pakistan were suspended since 1947. The Lahore-Delhi bus service, which had been started in 1999, again suspended in January 2002 because of political tension. Passenger movement by road and rail is very poor in South Asia due to poor cross-border connectivity. Bus services between India-Bangladesh and India-Pakistan are operating at a very limited scale. Between Bangladesh and India, only two passenger buses operate six days a week between Dhaka-Kolkata since 1999. Another passenger bus started between Dhaka-Agartala, on alternate days since 2002 but stopped recently. Four bus services are operating between different cities of India and Pakistan. However, because of several constraints, these are not operating smoothly. For example, traveling from Khokhropar, Pakistan to Munabi, India, is at a distance of 11 km (Figure 1), but one needs to travel to Islamabad, more than 1500 km to get an Indian visa and vice versa. If friendly arrangement could be made to issue visa on arrival at Atari, many more passengers from Pakistan could have made use of the train service to visit India or vice versa.

The only passenger train running between India and Pakistan, the *Samjhauta* (Friendship) Express train, twice a week connecting Lahore with Atari inside India (opposite Wagah in Pakistan, where transfer take place) since 2004. In 2006, another rail link between India and Pakistan was established along the Karachi-Khokrapar-Munabao route. Although, it is important for enhancing accessibility of mountain areas of North India, but it runs only once a week.
Not only cross-country infrastructure but also their maintenance is poor. It increases transport cost in freight movement. As a result, average transport cost is relatively high in cross-border trade. The average transport cost on the Kolkata-Petrapole route between Bangladesh and India, for example, is 40 percent higher than on other highways (Das and Pohit, 2004) although India has a 3.3 million km road network, one of the largest in the world.

4.2 Non-tariff and para-tariff barriers

During the last few decades, South Asian countries have been liberalizing the trade regime and moving their economies away from protectionism toward greater trade openness and global economic integration. Through liberalization process and initiative for tariff cut under SAFTA, tariff has been reduced considerably since 1990, though it is still relatively high. Although, tariff has been reduced considerably, non-tariff and para-tariff barriers had not been addressed significantly though Article 3 of the SAFTA Agreement, which clearly states that “SAFTA shall involve free movement of goods, between countries through, inter alia, the elimination of tariffs, para-tariffs and non-tariff restrictions on the movement of goods, and other equivalent measures”. Table 6 briefly presents non-tariff and para-tariff barriers in South Asian countries.

Table 6: Non-tariff barriers and para-tariffs is SAARC Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Non-tariff barriers</th>
<th>Para-tariffs barriers</th>
</tr>
</thead>
</table>
| Bangladesh | Health, religious, environmental and balance of payments purposes:  
- Quantitative restrictions  
- Quasi-ors  
- Import through state trading enterprises (salt)  
- Restricted port of entry |  
- Infrastructure development surcharge  
- Supplementary duties  
- Regulatory duties  
- Vat exemptions for specified domestic products |
| Bhutan | None | None |
| India | - Tariff rate quotas  
- Import through state trading enterprises  
- Health and sanitary regulations (quarantine fees)  
- Restricted ports of entry  
- Anti-dumping and countervailing duties  
- Customs valuation | Extra protection of certain products through restricted port of entry |
|-----------|-------------------------------------|---------------------------------------------------------------|
| Nepal     | None                                | - Special fees  
- Local development fee  
- Agricultural development fee |
| Pakistan  | - Mostly free from NTBs            | - Income withholding tax  
- Extra protection for some products through sales tax  
- Regulatory duties (mostly phased out) |
|           | - Exception: ban on imports from India of products not on the positive list of 771 items (corresponding to about 1500 8-digit HS lines)  
- Local content requirement in the auto industry | |
| Sri Lanka | - import ban (tea and certain spices)  
- import monopoly (wheat)  
- health and sanitary regulations  
- quantitative restrictions  
- quasi-QRs  
- import through state trading enterprises (salt) | |

The table shows that non-tariff and para-tariff barriers are lowest in mountain states of Bhutan and Nepal. While Nepal has limited para-tariff barriers, Bhutan has no non-tariff and para-tariff barriers. Bangladesh, India, Pakistan and Sri Lanka have different non-tariff and para-tariff barriers. For example, there is limited letter of credit opening facilities in the North East India and importers of North East India have to go to Kolkata to fulfill banking formalities for imports from Bangladesh. Likewise, Bangladesh has also imposed restrictions on certain importable items from India in terms of specified entry points.

India has granted Most Favored Nation (MFN) status to Pakistan but Pakistan has to yet to grant the same to India. Pakistani authorities, on the other hand, claim that Indian para- and non-tariff barriers particularly Indian customs authorities biased treatment against Pakistani consignments are denying market access to Pakistani goods to India (Associated Press of Pakistan, 22 March 2007).

Although, all the countries of South Asia have been pursuing market-led growth policy, they often intervene in market by imposing restriction on import or export of certain commodities. India, for example, has imposed ban on export to pulses, onion, and rice to Bangladesh (The Daily Ittefaq, 30 October 2007) and import betel-nuts from Bangladesh and Nepal. Although ban on import of betel-nuts from Nepal has been withdrawn recently, but only one route has been designated for importing betel-nuts from Nepal which made exporting betel-nut
from Nepal practically impossible. Even sometimes, trade and transit routes are used to achieve political goals such as create pressure on government. India, for instance, blockaded the border with Nepal in 1990 to create pressure on Nepal government and instituted significant trade restrictions on Nepal during the negotiation of a bilateral trade agreement between 2001 and 2002 to influence the negotiations (Faye et al., 2007:46)

These types of non- and para-tariff barriers have stunted trade growth significantly and have led to trade leakages to extra-regional sources. Pakistan, for example, imports iron ore and textile machinery at a higher cost than are available from India. Similarly, most of the India-Pakistan trade carries out via other countries or informal way because of difficulties in formal channel. Existing non-tariff barriers also drive up local input costs, thus making South Asian exports more expensive in relation to sources outside the region, which made South Asian countries as a whole less competitive in global market.

4.3 Complicated administrative rules and regulations

Besides poor infrastructure and non-tariff barriers, considerable difficulties exist in administrative rules, regulations and procedures in cross-border trade in South Asian countries, and traders have to incur high trade costs. Limited transportation routes, poor infrastructure facilities, non-availability of rail wagons and procedural clearances impose high administrative burden and transaction costs in cross-border trade. Transaction costs are incurred in terms of both money and time. The existing procedures and formalities for cross-border movement of goods in South Asia are cumbersome, time consuming and obstructive. As a result, the average time to move an export container to the nearest port, fulfilling all the customs, administrative and port requirements is much higher in South Asian countries in comparison to East Asian countries. Table 7 shows a number of days necessary for traders in the selected counties of South and East Asia to comply with regulatory requirements at different stages to export goods. While time to move an export container to the nearest port in China and Malaysia takes 20 days, in Singapore 6 days, and in South Asian countries more than 30 days. In South Asia, maximum time needed for mountain countries like Nepal and Bhutan is 44 and 39 days respectively. It is mainly due to additional formalities required for transiting.
Not only international trade but also the regional trade takes inordinate longer time. The average time required to clear Indian and Bangladeshi customs is about three times that in the developed world (World Bank, 2004). Table 8 presents delays, damages and their cost in intra-regional movement of cargo in selected routes. It shows that the highest cost incurred at Kathamndu-Dhaka route (3.59%) to transfer agricultural products and lowest in Kolkata-Dhaka (1.45%) in transferring yarn. The highest cost in Kathamndu-Dhaka route is attributed to high damage during the intermediate handing (1.5%).

### Table 7: Time to move an export container to the nearest port

<table>
<thead>
<tr>
<th>Country</th>
<th>Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>35</td>
</tr>
<tr>
<td>Bhutan</td>
<td>39</td>
</tr>
<tr>
<td>China and Malaysia</td>
<td>20</td>
</tr>
<tr>
<td>India</td>
<td>36</td>
</tr>
<tr>
<td>Hong Kong, China</td>
<td>13</td>
</tr>
<tr>
<td>Nepal</td>
<td>44</td>
</tr>
<tr>
<td>Pakistan</td>
<td>33</td>
</tr>
<tr>
<td>Singapore</td>
<td>6</td>
</tr>
</tbody>
</table>

Most of the delays occur at border crossing for custom clearance, fulfilling other formalities, and transshipment. Border-crossing problems arise because of distance of customs clearance centers from the border, lack of storage, loading, unloading, and lack of transshipment facilities. For instance, the sanitary and phytosanitary testing laboratory in Kolkata is 1,000 km from the customs facility at Birgunj, Nepal. Exporters have to wait for weeks for test results and in the process pay additional fees while vehicles are detained (World Bank, 2004). The problem is exacerbated by the complicated procedures and lack of efficient customs operations\footnote{South Asia, except India, continues to lag behind in information technology deployment for customs administration. Electronic data interchange allows the electronic exchange of documents and forms and thereby the streamlining of clearances.}, including lack of transparency of procedures for inspection, informal payments and inadequate preparation of customs document by the exporters. At least 22 documents are required for a cross-border trade. As suggested by Pohit and Taneja (2000) the main reasons for transaction costs in Indo-Nepalese and Indo-Bangladeshi trade are delays caused by complex customs and transit procedures.

Table 8: Delays and damages in movement in intra-regional cargo

<table>
<thead>
<tr>
<th>Movement, from to</th>
<th>Mode</th>
<th>Cargo</th>
<th>Total Time, days</th>
<th>No. of handlings</th>
<th>Damage per intermediate handlings, % of cargo value</th>
<th>Delay cost, % of cargo value</th>
<th>Damage, % of cargo value</th>
<th>Total cost, % of cargo value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kathmandu-Dhaka</td>
<td>Truck</td>
<td>Agriculture products</td>
<td>4.6</td>
<td>3</td>
<td>1.5</td>
<td>0.59</td>
<td>1.50</td>
<td>3.59</td>
</tr>
<tr>
<td>Thimpu-Dhaka</td>
<td>Truck</td>
<td>Limestone</td>
<td>3.6</td>
<td>3</td>
<td>0.75</td>
<td>0.11</td>
<td>0.75</td>
<td>1.61</td>
</tr>
<tr>
<td>Kolkata-Dhaka</td>
<td>Truck</td>
<td>Yarn</td>
<td>11.3</td>
<td>3</td>
<td>0.50</td>
<td>0.45</td>
<td>0.50</td>
<td>1.45</td>
</tr>
<tr>
<td>Kolkata-Agartala</td>
<td>Barge</td>
<td>Cement</td>
<td>19.0</td>
<td>4</td>
<td>0.75</td>
<td>0.76</td>
<td>1.50</td>
<td>3.01</td>
</tr>
</tbody>
</table>

Source: calculated based on Table 3.5, 3.6 & 3.7 in Subramanin and Arnold 2001
The complicated procedures provided opportunities for corruption. To expedite the process, traders often have to bribe the concerned authorities. Table 9 shows the informal payments at different routes of cross-border trade. The high informal payment increases trade cost considerably and inhibits cross-border trade.

Table 9: Informal payments for cross-border trade

<table>
<thead>
<tr>
<th>Route</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh-Phulbari corridor through Kakarvitta</td>
<td>30 percent of invoice value for a consignment</td>
</tr>
<tr>
<td>Haldia, Kolkata</td>
<td>US$ 150 per consignment on imports and exports</td>
</tr>
<tr>
<td>Indian border crossing points</td>
<td>Rs 6,000 per container and Rs 2,000 to Rs 3,000 per truck</td>
</tr>
<tr>
<td>Raxaul-Birgunj border crossing, payable at the Indian side of the Nepalese border.</td>
<td>Rs 80 per ton</td>
</tr>
</tbody>
</table>

Source: Subramanin and Arnold 2001: 70

Because of these difficulties, intra-regional trade and investment remains far below the potential level. Mountainous countries like Nepal and Bhutan suffered most as they have to be completely dependent on their transit neighbors’ infrastructure for export/import of their goods.

5 Implications of physical and institutional bottlenecks in cross-border economic cooperation

Physical and institutional bottlenecks have significant implications for deepening economic integration in South Asia. Against the conventional view, this study reveals that low trade complementarity is not the only reason for low level of intra-regional trade among SAARC countries. Physical and institutional bottlenecks along with weak political commitment considerably hinder intra-regional trade and economic integration. With similar economic structures and level of technologies, more than 60 percent trade take place among the EU countries (Spachis, 2004). Even intra-ASEAN trade is more than 22 percent (Khan et al., 2007) although the countries are of almost similar level of development. While Pakistan and India was separated, more than half of Pakistan’s imports came from India and nearly two-thirds of its exports went to India. But, unfortunately
formal trade among the largest economies is insignificant. As per estimate made by Punjab, Haryana and Delhi Chambers of Commerce and Industry (PHDCCI), there is potential of five billion dollar trade between India and Pakistan. Frankel and Wei (1995) rightly mentioned that the trade between India and Pakistan is 70 percent lower than that of two similar economies and they are behaving against the natural block and their trading patterns show what is called ‘inverse regionalism’ (Lahiri, 1998). Some of the countries even are hesitant to offer MFN status to neighboring countries and buy other than member countries with higher cost, which increases production cost and reduces competitiveness. It seems political hostility overrides the economic rationality, which makes the region not only less competitive in global market but also weak in negotiation in international fora. While, European Economic Commission gained significantly during the Uruguay Round trade negotiation through regional solidarity, South Asian countries could not play any significant role during the Uruguay round negotiation due to poor solidarity though they have comparative advantage and common interest in many products including tea, jute, readymade garments, fish, spices and manpower (Madawela, 2003). Organization of Petroleum Exporting Countries (OPEC) is a classic example, which enhanced market power considerably through common policy.

Gains from trade depend not only on the tariff liberalization but also on the quality of infrastructure and logistic facilities. Due transport and institutional bottlenecks, countries of South Asia are loosing heavily on many fronts including high trade cost and difficulties in movement in people. Poor transportation and communication impose direct costs on cross-trade and it inhibits the trade and economic potential including tourism.

Although, across the South Asia, the transport infrastructure is already in place built during the British period. If, at least, an improvement is made, a traveler could easily take train at Delhi to go to Peshawar or a bus, which travels from Dhaka across India to Karachi since there is a rail and road infrastructure in place. Similarly, a traveler could take a bus ride from Kolkata to Agartala in North-East India, transiting across Bangladesh. Nevertheless, following the partition of British India, transport system developed only in the national context and there is little consideration for movement of people of neighboring countries. The poor transportation and communication also limits the return to investment in mountain areas particularly in Bhutan and Nepal on internal infrastructure as market opportunities are constrained, which in turn constrains infrastructure development.
The cost of non-cooperation is very high for the people of South Asia. Due to lack of facilities for formal trade, informal trade is going on and society has to bear the additional cost. Despite complementarity in textile and apparel sector in South Asia\textsuperscript{17}, vertical specialization is limited due to prevailing trade barriers. Trade and investment goes hand-in-hand. Deepening economic integration increases the potential for more productive use and management of the shared resources like rivers, fishing areas, railways and hydroelectric power facilities, transportation, tourism (Sobhan, 1999; Khan and Khan, 2003). South Asia as a whole is energy deficit, although some countries like Nepal and Bhutan have huge potential for generating power from hydro sources. Nepal has 83,290 MW and Bhutan has 21,000 MW hydro power potential (Quader, 2006:348). Unfortunately, this vast renewable resource remains untapped. So far, Bhutan has been able to utilize 1.6 percent and Nepal only 0.3 percent (Quader, 2006:348). The great constraints for developing and utilizing these potential is the secured and stable market (World Bank, 2004), which can be achieved by harnessing regional cooperation. Establishment of a regional power grid comprising Bhutan, Nepal, India and Bangladesh can ensure diverse market and facilitate tapping of these important resources, which can significantly boost economic prospects of the entire region.

Regional cooperation may also help tap the oil and gas resources avail just outside South Asia. Moreover, by cross-border cooperation, energy and power can be managed more efficient way. For example, supply power from Pakistan’s national electricity grid to neighboring power deficient Indian states or to supply Bangladeshi gas to the power-deficient industrial Kolkata could pave the way for economic growth and opening up long-term regional energy trade and investment. There is also a considerable scope for development of intra-regional tourism, which can generate employment and facilitate cross-country learning. By strengthening economic integration, South Asian countries will have more leverage in the global trade system if they work out a common position on issues of common concern.

\textsuperscript{17} India and Pakistan being world’s largest producers of cotton and have a natural advantage in the production of textile yarn and fabrics. Their capacity in producing textile machinery and equipment is increasing tremendously. On the other hand, Bangladesh, Sri Lanka, and Nepal have been doing well in apparel manufacturing and exporting. Deeper economic integration can facilitate inter-industry trade and investment based on comparative advantage.
6 Creating enabling conditions for promoting cross-border economic cooperation

For deeper integration, it is necessary to create enabling environment by removing trade barriers and expanding available options for the participating countries as well as perspectives needs to be changed. South Asian countries often over-emphasize on political sensitivities over economic rationality. It is important to understand that while political harmony is pre-requisite for economic integration, economic cooperation and political harmony are mutually reinforcing. Experiences from Asia and elsewhere suggest that movement of people across countries and economic interdependence can create a better climate for dismantling walls of distrust and creating a better climate for resolving political differences. Japan’s relations with its neighboring countries such as China and South Korea would have been even more problematic without regional spirit. The countries of the MERCOSUR, the common market involving several South American countries, overcame mutual suspicions to allow transit rights for member countries. The success of the EU has showed that regionalism, even on such a wide scale, can be instrumental even in overcoming historical animosities and guaranteeing regional security and stability.

Looking at the experiences from other regions, South Asian countries also need to further the cooperation to widening the economic opportunities for people of the region. It is time necessary to move beyond the traditional commodity trade and harness the benefits of economic cooperation in areas such as infrastructure, transportation, communications, hydro-power, power sharing, and manpower development. Labor and capital markets also need to be integrated. For this, an integrated approach need to be adopted to facilitate trade and economic cooperation. This section briefly outlined a framework for creating enabling conditions for promoting cross-border economic cooperation in South Asia. The framework discussed below, however, should be considered as generic as further in-depth study is required for a comprehensive framework.

6.1 Integrating the infrastructure and transport network

In order to facilitate cross-border trade and economic integration, attention should be paid to transport integration. The Islamabad SAARC Summit rightly identified transport and communications as important areas of cooperation. In development of infrastructure, attention should be paid to regional connectivity and compatibility. At the same time, attention should be given to mountain and other marginal areas to improve the access of these regions to sea and core markets. South
Asia inherited an integrated transport infrastructure from the British, transport infrastructure is already in place in and across South Asia, but many areas have fallen into disuse, which need to be rebuilt by building greater political harmony, as the main obstacle to improve connectivity remains political.

It is important for expansion of transport and telecommunication infrastructure and their integration across the region. Transit facilities beyond the territories of member countries should be provided. Bangladesh and Pakistan should take advantage of their unique geographical location and sell transport services, i.e. “trade in services” to neighboring countries. Bangladesh can become a “transport hub” for the sub-region comprising Noth East India, Nepal and Bhutan. Opening up access through Chittagong Port may also provide incentive to exploit natural resources in Noth East India for mutual benefit. Trade surplus countries could consider investing in trade deficit countries under decentralized production system to generate even flows as well as to contribute to reducing trade gaps.

6.2 Need to harmonize rail and road systems

Incompatibility in rail and road systems has remained another obstacle in transport integration. For example, India and Bangladesh wagons have different coupling and breaking systems. Present rating of Jamuna Bridge does not allow Indian fully loaded wagons to pass although a dual gauge railway network exists up to near Dhaka (Rahmatullah, 2006). In order to make transport cooperation viable, it is, therefore, important to harmonize rail and road systems.

6.3 Eliminating tariff, non-tariff and para-tariff barriers

The development of infrastructure alone cannot ensure free movement of goods and services unless tariff, non-tariff and para-tariff barriers are removed. The existing procedures and formalities for cross-border movement of goods in South Asia are cumbersome, time consuming and obstructive, which impedes trade promotion and economic integration. It is, therefore, important to simplify the procedures for cross-border movement of goods and services. To make the procedures and documentation simple it is important to adopt common tariff nomenclature, harmonization of customs procedure and evaluation methods, and harmonization and mutual recognition of standards directly affecting trade transactions, such as weights and measures and technical specification of goods and services. Automation of documentation particularly electronic documentation
can save time and money. Moreover, frequent intervention in market damage trust and confidence and therefore need to be avoided.

6.4 Regularizing informal trade

Informal trade is unlikely to be eliminated but efforts must be made towards formalizing it, if South Asia has to increase trade in the region and benefit from trade liberalization. This calls for regularizing and regulating informal trade and bring them under formal channel through trade facilitation.

6.5 Facilitating Cross-border Investment in the Region.

To promote economic integration, it is critical for South Asian countries to improve the climate of intra-regional investment. Regional cooperation initiatives providing preferential treatment to members have been largely confined to trade and have not extended to investment. Develop legal frameworks that protect cross-border investment and set up fair and equitable mechanism to resolve controversies. The South Asian countries should take measures for removing administrative and regulatory constraints on the flow of investment between them, exchange information on possibilities of investment and take other measures for the promotion of investment. Public and private sector cooperation need to be strengthened through joint ventures. Particular attention should be paid in strengthening cooperation in the use of transborder rivers (the Ganges, the Brahmaputra, and the Meghna). Bangladesh, Bhutan, India and Nepal can be benefited from regional water management in hydropower and flood control.

6.6 Take coordinated efforts to promote regional tourism

To tap the economic potential afforded by the global tourist industry as well as to encourage intra-SAARC tourism, there is a need for coordinated activities to improve road, rail and air links and simplify visa-procedures for tourists and pilgrims. Private sector needs to be encouraged to promote regional tourism and their activities need to be coordinated.
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5.4 Opportunities for Enterprise Development and Regional Cooperation in the Himalayan Region

D. Choudhary and K. Banskota

Abstract

The Hindu Kush Himalaya (HKH) region is home to some of the poorest of peoples, the majority of whom belong to a diversity of ethnic groups and minorities. According to the World Bank 47 to 83 percent of people in the HKH countries earn less than two U.S. dollars a day. Traditional mountain agriculture based economies are facing productivity and technology fatigue and are unable to meet the increasing food and income requirements for a growing population. In such a scenario, enterprise development on mountain products and services is recognized as a source of employment opportunities and wealth creation. It can contribute to social stability and pro-poor growth. However, in rural areas of mountain regions investments in micro-enterprises, which are mostly in the informal sector, are minimal and majority of entrepreneurs operate with very little capital. As such most enterprises (over 70%) in developing countries such as Bhutan, Bangladesh and Nepal are small and micro-enterprises enterprises (SMEs).

In mountain regions it is important to select products and services that have a comparative and competitive advantage. Some of the niche and well known sectors include medicinal, aromatic and dye plants (MADPs) based products, tourism, horticulture processing, and traditional skill/knowledge based products etc. However, enterprises (existing as well as start-ups) on such products face constraints in terms of inaccessibility to information, services (financial and non-financial), markets and marketing infrastructure/institutions; low levels of skills, technology and professional management; increased competition and strict framework conditions for trade in a globalized world. These factors increase costs and reduce ability of mountain enterprises to realize the value added potential and to equitably participate in markets.

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Enterprise development together with value chain promotion initiatives has the potential to improve efficiency of marketing channels and promote pro-poor livelihood development. Innovations in terms of specialized clusters and certification can enhance market access; strengthen co-operative and complementary relations between small-scale rural producers and large firms. Emerging trends show that the focus needs to be on maximizing enterprise returns from the market place, to enhance opportunities to compete in a greater range of markets than they traditionally have had access to and the equitable participation and benefit sharing with the poor. In order to make economic growth inclusive it is important to have an integrated approach with clear roles of different facilitation organizations – Government, NGOs and Private sector. Some of the important elements would include a pro-poor institutional framework; an enabling environment for the poor to participate in markets, business development services, capacity development, corporate social responsibility, public private partnership (PPP), access to finance and appropriate SME facilitation programmes.

There is a need to share regional experiences and develop multi-lateral and bi-lateral programmes at the regional level on micro and small enterprise linkage and market facilitation so as to develop capacities of different stakeholders, bridge information gaps and promote cross-sharing of experience and technology for targeting a larger segment of population and ensuring equitable participation of the poor in the growth process.

1 Background: Livelihoods and Enterprise Development Issues in the Hindu Kush Himalayas

A majority of the population in the Hindu Kush Himalayas (HKH) depend on subsistence agriculture. The economy of these regions is largely stagnant because of its narrow economic base. Agriculture, given limited arable land base and its fragility is unable to provide sustainable livelihood and improved income opportunities to the ever-increasing population. The rudimentary industrialization that has taken place in some areas also does not offer much scope for employment and income generating opportunities. Farm households typically earn cash from seasonal employment either by working on the land of more wealthy farmers or through migration. Hence the region is characterized by pockets of chronic poverty and unemployment accompanied by large scale environmental threats.

According to the World Bank 47 to 83 percent of people in the HKH countries earn less than two U.S. dollars a day. Traditional mountain agriculture based
economies are facing productivity and technology fatigue and are unable to meet the increasing food and income requirements for a growing population. Also globally traditional commodity markets are diversifying into more value added and niche products.

The sustainable way to promote new employment and income opportunities is to use the resource endowments and comparative advantages of mountain niches in an ecologically sound manner for the benefit of mountain communities (Jodha, 2003). The challenge is to transform the prevailing subsistence-oriented agricultural mode of economic production into one complemented by commercial sources of income. Mountain areas are endowed with high degree of niche and comparative advantage which could be harnessed in a sustainable and environmental friendly manner. This will entail providing equitable access to sustainable markets within the scope of resource endowment and developing competitive advantage in the production to market to consumption system for overall mountain development.

Enterprise development is a crucial component in the production and service sectors in mountain regions. Enterprises link the three pillars of development: the economic, social and environmental components, which is essential for sustainable mountain development. In the age of globalisation where access to markets is governed by stringent standards and where competition offers consumers a host of choices it is imperative to generate systemic competitiveness in the production and marketing process. Rural enterprises provide the entry point in the production system which enables the poor to participate in the process of globalisation (Choudhary, 2003). Their linkages with larger enterprise and different actors in the production to consumption system can lead to the achievement of broader development objectives, including poverty alleviation, economic development and the promotion of more democratic and pluralist societies in mountain regions leading to pro-poor growth.

2 Status and constraints of micro-enterprise development in the HKH

Micro-enterprises in the Hindu Kush-Himalayas are under-developed and in a primitive stage. Most of them are household based in character and primarily caters to the survival needs of the local people. It is generally observed that enterprises comprises of small and micro-enterprises (SMEs) operating in the informal sector producing and distributing goods in unregulated but competitive markets. These enterprises are generally independent, usually family owned
low skilled, use rudimentary technology, are labour intensive and operate with very little capital.

Enterprise activities are secondary to the main household vocation, viz. subsistence agriculture and are carried out to earn cash to buy non-farm products of basic necessities. Most production is thus for self consumption and local markets rather than a primary occupation driven with a profit motive. In such an economic environment characterized by a general lack of ‘enterprise’, the attempts at utilising local or regional niche for production of items with comparative advantage with a view to selling them in larger markets are negligible.

Mountain areas have been serving as a source of raw materials to the economies in the lowlands and urban areas. Obviously, such a relationship is characterized by structural and operational inequities, resulting in a selective over extraction of some raw materials. Mountain entrepreneurs seldom receive fair prices for their products due to constrains imposed by poor mobility, perishability and low bargaining power, with the result being under-pricing of highland resources, products and services. Furthermore, experiences show that enterprises (existing as well as start-ups) in mountain regions face constraints in terms of inaccessibility to information, services (financial and non-financial), markets and marketing infrastructure/institution; low levels of skills, technology and professional management; increased competition and strict framework conditions for trade in a globalized world (Choudhary, 2005). On the other hand, the flows of resources to the mountain areas have been largely guided by the infrastructural needs to extract mountain-resources for the lowland areas and for security concerns. Even otherwise, the flows generally have consisted of limited supply of consumer goods and foodgrains to the mountains (Banskota and Sharma, 1999). This virtually one way flow of resources from the mountains to the lowlands permits rapid development of the lowlands and urban areas and often condemns the supplying area to an increasing stagnation and underdevelopment. The poor state of development in the highland areas has been a cause and effect of its marginalization and is accentuated by inaccessibility, fragility, and even diversity of the highland areas (Jodha 1992).

In the era of globalization where the small mountain producers with their primitive enterprises are facing stiff competition from many cheaper substitutes making such enterprise almost non-viable in many cases. There is a lack of innovation to face the new challenges of competition where the need is for value addition and product development for high-value low-volume products meeting market requirements. The absence or predominance of the above factors increase
costs and reduce the ability of mountain enterprises to realize the value added potential and to equitably participate in markets. These together with the socio-economic and cultural constraints handicap poor women and men from making entrepreneurship a career.

Overall, the micro and small enterprise based diversification of the economy in the mountain regions is severely constrained by three distinct, yet mutually reinforcing categories of factors. These include:

– Physical and Environmental-limited, dispersed and environmentally sensitive resource base, difficulties in developing access-improving infrastructure.

– Economic-limited local markets and difficult access to outside markets, limited access to inputs, technologies and services, lack of skills in product selection, value addition and standardization, and competition from products of other areas produced at lower cost.

– Policy Related-neglect of mountain specific constraints and opportunities in overall and sectoral policies, thus making them unfavourable for micro-enterprise development, no specific policies to specially utilise opportunities and reduce constraints for enterprise development in these areas.

3 Product structure and nature of Enterprise Development in HKH

To understand enterprise development in HKH region, the definition of enterprise will have to be broad based that would include utilization of any opportunity in farm, off farm and non-farm sectors, undertaken to produce goods and services for market (Papola, 2003). It could, thus, be defined as an activity aimed at production of goods and services for sale.

Given the limitations of resources and difficulties in their productive use, inaccessibility and isolation and under-developed infrastructure and markets, the choice of commodities that could be profitably produced in mountain areas is limited. Yet, diversity of resources and capacity of mountain people to improvise and innovate have led to the prevalence of a highly variegated product structure in many mountain areas. However, it has rather been on a small scale and mostly without significant remunerative returns. In recent years, however, improvements in accessibility with the development of means of transport and communication and increased exposure to outside world have led both to opportunities and aspirations among the mountain people to venture into enterprise based activities.
In Chittagong Hill Tracts, Bangladesh, 97 per cent of enterprises in non-farm sector are in micro-enterprise sector (i.e. each enterprise employing less than 10 workers) (Papola, 2001). In Nepal, with over 80 per cent of area and about 50 per cent of population in hilly and mountainous areas, over 95 per cent of industrial enterprises are in the small and micro sector (SBPP/ZDH, 1991). Product structures and employment patterns also differ in regions within the country, like for those which are more advanced in terms of infrastructure, have access to services, and experienced agriculture development like plantation crops for e.g. tea. Broadly, trends show that enterprise activities in the mountain regions are mostly dominated by activities such as small-scale processing, tourism, trade and repair services.

As against the situation in most other areas in HKH region, there appears to be a deliberate and conscious effort in Western Sichuan (China) to focus on specialized products based on mountain specific resources. In the structure of enterprises different products in agro-based, animal husbandry based and non-timber forest produce based categories have emerged successfully as important and fast growing in the region. Many parts of the HKH region have also shown diversification of farming in terms of comparative advantages such as apple farming and processing in Himachal Pradesh, horticulture products in Chittagong Hill Tracts in Bangladesh and Meghalaya in India.

Mountain tourism, one of the services with comparative advantages, has increased tremendously over the past few decades both for the reasons of increasing interest of people in mountain environment and adventure and special efforts on the part of policy makers and tourism entrepreneurs to market mountain tourism. Thus the number of tourists has increased manifold in Nepal and central and western Indian Himalayan region and new areas have been opened for tourists in Nepal, India and Pakistan in recent years. These developments have provided an impetus to the development of tourism product and services enterprises in the region.

In terms of natural products, medicinal and aromatic plants (MAPs) are the niche products of the region that are gaining an increasing attention from development planners and business alike. In Nepal it is estimated that every year 20,000 tons of MAPs worth 18–20 million US$ are traded and about 90% of this collection is exported mainly to India in raw form (Nagpal & Karki, 2004). The MAP sector in Bangladesh is worth US$ 14 million with local supply comprising of 70% by volume and 40% by value (SEDF/IC, 2003). It is estimated that the total annual demand in Indian markets for MAPs is 400,000 tons, while the supply is
250,000 tons/year (GOI, 2000). Globally, China tops the list of exporting countries with an average annual export volume of 121,900 tons valued at US$ 264.5 million (Nagpal & Karki, 2004).

However, despite of the potential and some success, there are several challenges in terms of technology, markets, policy and framework conditions including mandatory standards and certification that are constraining the growth and efficiency of mountain enterprises. Despite potentials there are gaps in up scaling good practices to reach a larger population for engaging them in the growth process. Emerging regional and national experiences indicate that supply driven approaches with free provision of tailor made services with the absence of market facilitation programmes and commercial viability for enterprise development are not sustainable.

4 Global Trends for Enterprise Development – Potential to use in HKH

Over the past few decades, enterprise development approaches have emphasized on integrating demand, supply, policy and governance issues into a single package that has practical application and can involve a range of stakeholders. This is expressed in ideas about supply or value chains and in promoting industrial clusters. Under the value chain approach, the distribution of benefits and the mechanisms by which access to benefits is maintained and controlled are traced in order to provide indications of how small producers can be integrated into domestic, urban and export market systems (Davis, 2004). The application of the approach that is likely to be more successful in mountain regions are those where small enterprises are integrated in the value chain of large enterprises (lead firms) that offers the basis of forward and backward linkages.

Recent trends have underlined the merit of business development services (BDS) as a means for helping SMEs integrate into value chains that is, enabling them to reach markets and create products that consumers demand (SEEP Network, 2005). A comprehensive examination of BDS markets (financial and non-financial) and value chains can assist in designing systemic solutions to market problems. The two subsystems – BDS markets and value chains – are complementary components of the larger market system into which enterprises must integrate for improving their efficiency and competitiveness. A facilitating organization (Government, NGOs, Business Membership Organizations, Promotion projects etc) can also use its knowledge of the value chain to determine income distribution and calculate the sustainability of proposed services. BDS market research and
analysis (e.g., actors who can supply bundled services\textsuperscript{20}), and individual providers can be also assessed for their strengths, weaknesses, and potential contribution to the overall development of the market – for example, certain large whole-salers may be more willing to invest resources in the development of MSE producers. (Box 1).

**Box 1: Some steps from Katalyst project in Bangladesh on BDS Tasks in developing a sustainable system at the Programme Design Stage**

- Set up train-the-trainer programs for SMEs to improve business skills, at prices they are willing to pay.
- Develop linkages (1) between SME producers and buyers, and (2) that offer bundled services to SMEs and market access for SMEs products;
- Organize bulk-buying groups so that SMEs can access higher quality inputs more affordably, leading to greater profitability.
- Assist traders to learn how to help SMEs in diversifying or adapting products to meet the demands of consumers in higher value markets.

Value chain analysis can also be instrumental in identifying key relationships in a sub-sector that might be leveraged to support SMEs. A facilitating organization can also be the communication vehicle and catalyst for an underdeveloped value chain. If the facilitator sees a market opportunity, it can communicate this to actors throughout the chain especially focusing on the SMEs and help them develop a plan for how they can work together to take advantage of the opportunity. This can generate motivation among key stakeholders to take risks – for example, a medicinal plant wholesaler may be inspired to work with new producers or assist producers in diversifying their value added products.

Linkage development initiatives have the potential to improve the efficiency of supply chains, foster pro-poor growth and these should form an integral part of strategies aimed at enterprise development. As business grows and value chains evolve the supplier-buyer relation becomes even more intensive and demanding in terms of quality, reliability and volumes of supply. In a globalised world where areas of production and consumption spread across national boundaries firms

\textsuperscript{20} Several business services provided together as part of a package. This package of services may be offered independently or as part of another commercial transaction – for example, a transaction between a wholesaler and a producer.
need to develop efficient supply chains to meet standards and market requirements (Choudhary 2007). Firms which have an efficient and transparent supply chains with two way flow of information remain competitive in the long run. Vertical linkages between operators at different levels of the value chain and horizontal linkages between operators at the same stage of the chain can enhance market access, strengthen co-operative and complementary relations between small-scale rural producers and large firms, and enable the former to compete with their larger and often urban counterparts. This is an area which is extremely important in the Himalayan region where the producers are largely unorganized, have small volumes, sell raw products with little value addition and have poor bargaining capacity. Business linkages between small suppliers and larger buyers such as contract farming need to be developed and commercial associations of producers and buyers strengthened.

5 Improving Competitiveness and ensuring Pro-poor Growth of Enterprises in HKH

Promoting pro-poor growth can take different perspectives depending on the subsystem of the economy that is to be promoted. In doing so it is important to combine the strengths of different approaches. A fundamental distinction is between the sectoral and the spatial perspective on economic development (GTZ, 2007). While spatial perspective such as local and regional economic development (LRED) focuses on enhancing the competitiveness of a location and the local or regional economy, the sectoral perspective such as value chains aims at activating the growth potential of a particular market. The sectoral perspective can be further broken down into consumer product markets on one side, and service or resource markets on the other. In a product market (i.e. value chain) perspective poor people come into play as producers and suppliers. In a business service (BDS) or microfinance development perspective they are seen as clients of a pro-poor service system that needs to be put in place. Appropriate delivery mechanisms and institutional linkages to retain more value added at the local level can foster pro-poor growth.

Opportunities for enterprise development in mountain regions are vast and diverse. However, it is important to select products and services that have a comparative and competitive advantage in these regions. Some of the niche and well known sectors include medicinal, aromatic and dye plants (MADPs) based products, tourism, horticulture processing, and traditional skill/knowledge based products etc. The focus needs to be on maximizing enterprise returns from the
market place, to enhance opportunities to compete in a greater range of markets than they traditionally have had access to and the equitable participation and benefit sharing with the poor. As the economies and markets of certain products and services of the ICIMOD regional member countries grow, the challenge is to make the benefits of growth more equitable by allowing the poor to have a better share of the pie.

To link the above, in the case of tourism it has been found that interventions in pro-poor tourism partnerships need to cover areas beyond simply supporting community tourism. Apart from designing appropriate tourism products and services based on the assets, actions outside the tourism sector can boost pro-poor tourism partnerships. It has been observed that enhancing economic impacts requires actions with poor producers; additional marketing efforts and policy reforms (see Box II).
Box II: Wider Focus Needed on Pro-Poor Strategy-Lessons Learned from Pro-Poor Tourism (PPT) Experiences (ODI, 2001)

- **A diversity of actions across levels** is needed. PPT goes well beyond simply supporting community tourism. It requires action at micro, meso and macro level on several fronts, including product development, marketing, planning, policy, and investment.

- There is a clear need to work across stakeholders. Effective communication is essential, and a **driving force** or champion is useful.

- **Location matters – the destination.** PPT works best where the wider destination is developing well. It is likely to struggle in unsecure areas.

- **Location matters (II) – remoteness.** In remote areas, poverty impacts are likely to be of greater significance, though tourism may be more limited in scale. Dispersing tourism to remote areas – even without further explicit PPT interventions – can be useful (so long as negative impacts do not outweigh the positives).

- **Actions outside the tourism sector can boost PPT.** General policy initiatives unrelated to tourism, such as land tenure, small enterprise support, improved education, and more representative government would increase local involvement in the industry over time, without any specific reference to tourism.

- **PPT strategies can be incorporated into broader tourism development.** The explicit use of pro-poor language can even be avoided if this is helpful in achieving acceptance.

- **PPT strategies often involve the development of new products,** but these should be integrated with mainstream products if they are to find markets.

- **Ensuring commercial viability** must be a priority. This requires close attention to product quality, marketing, investment in business skills, and inclusion of the private sector.

- Enhancing **economic impacts** requires actions with poor producers, plus marketing efforts and often policy reform. It is important to the poor to maximise both regular jobs and casual earnings opportunities.

- **Non-financial livelihood impacts** can also significantly reduce vulnerability, and more could be done to address these explicitly. In particular, improvements in access to assets by the poor, and participation in decision-making can have substantial long-term benefits.

- **Expect slow results.** Manage expectations, develop short-term benefits meanwhile, invest in building local ownership.

- **External funding may be required** to cover start-up costs (especially the transaction costs associated with working with various groups).
6 Conclusion

In order to achieve the results of pro-poor growth it is important to have an integrated approach with clear roles of different facilitation organizations – Government, NGOs and Private sector. Some of the important elements include:

- Pro poor institutional framework – clusters of specialized rural enterprises; processing centers; common facility centres for rural-urban market linkages; employment generation in rural areas.
- Enabling environment – entrepreneurship promoting laws and policies, simplified procedures, single window clearances, financing etc.
- Business development services - technical business aspects, legal services and the provision of access to R&D facilities.
- Capacity development – function based training and institutions for human resource development over the long term;
- Innovations in technology, standard operating procedures; quality standards, and certification etc
- Corporate social responsibility – ensuring private sector association with rural enterprises – sharing information, technology, design and triple bottom lines (economic, social and ecological) and Public Private Partnership (PPP).
- Access to Finance – Venture funds, factoring, etc.
- SME Facilitation programmes – governments/ NGOs and private sector beyond the value chain, market diversification, peer group networking – associations of producers.Business membership organizations (BMOs).

In the Himalayan region, while some of the countries like Bangladesh, China, India and Pakistan have made considerable advances in small and medium enterprises development others are yet to come up to the stage where they can compete in global and regional markets. Even within these countries there are disparities between rural and urban areas in terms of the benefits of such advances and growth. There is a need to share experiences and develop multi-lateral and bilateral programmes on micro and small enterprise linkage and market facilitation so as to develop capacities, bridge information gaps and promote cross-sharing of experience and technology for targeting a larger segment of population and ensure equitable participation of the poor in the growth process.
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1 Introduction

This paper focuses on Badakhshan, a high mountain area located in the Southeast of Tajikistan and in the Northeast of Afghanistan in the Pamir region. The mountain region of Badakhshan is divided politically between today’s Tajikistan and Afghanistan, and naturally by the River Panj (formerly as Oxus River). In both countries, Badakhshan regions are landlocked and poorly connected to the political, administrative and economical capitals of their countries and their population suffers from poverty that is higher than the national average.

Badakhshan used to be a region where trade has been very active which is endorsed by the archaeologists who have found tracks of exchanges dating back to the Bronze age. However, the establishment of political borders at the end of the nineteenth century split Russian Turkestan on one side and Afghanistan on the other side that led to closure of these borders in the 1930s and stopped the trade activities. Likewise, the trade between Tajikistan and Kashgaria also stopped in the 1930s. A region that was a proactive trading platform thus became landlocked; and members of the same communities and families were split for more than 60 years.

During the Great Game, and throughout the 20th century, transportation infrastructures were developed differently on the Russian/Soviet side and on the British and Chinese dominated areas. The modern railways and road-infrastructures were developed early on the Russian/Soviet side while the infrastructure on the British and Chinese dominated areas was developed recently. The Soviet approach aimed at providing ample services to the Soviet-dominated areas and was not meant to enhance cross-border trade. But, later on other road systems, for example, the Karakoram Highway, was constructed in the 1970s that connected areas across the borders of Badakhshan.

However, after the collapse of the Soviet Union and the gradual re-opening of the borders, the Aga Khan Development Network (AKDN) took initiative of its
programs and has been working with the aim of promoting regional cooperation for the benefit of communities living on both sides of the border.

2 History of cross border relations involving Badakhshan

Before the end of the 19th century, both communities across the Oxus (Amu) River were part of the same principalities (see map below). They were sharing the same culture and belief system and the exchanges across the Oxus were numerous. Proof of exchanges dates back as far as the bronze age. In the middle age, part of the Oxus was along the Silk Road. Metal, jewelry, weapons, and lapis lazuli were traded.

Figure 1: Badakhsahn in mid-19th century. Cartography H. Kreutzmann 2008
During the great game, a border was established in 1872/1873 along the Oxus to split the Russian and British areas of influence, the two superpowers of the time. On one side of the Oxus was Russian Turkestan; and on the other side was Afghanistan, playing the role of a buffer state between Turkestan and British India. However, border making during the Great Game did not affect trade negatively. Badakhshan was exporting opium and horses to Eastern Turkestan and was importing other Central Asian goods from the urban oases along the Silk road (Kashgar, Yarkand, etc). Trade links were strengthened by the fact that, both superpowers competed to dominate trade in the “Great Game” area. Russian goods such as cotton prints were transported from the Ferghana valley to Kashgharia across the Pamirs, whilst one of the three routes linking Kahgharia to British India, the Chitral route, used to cross Badakhshan in the Wakhan valley. This route was the quickest of the three routes and the less expensive for the transport of certain items such as charas (hashish), felts and animal skins. In the 1920s, the transport of charas from Xinjiang on this route accounted for over three quarters of the goods transported. Besides this valuable drug, other items traded on the Chitral route via Badakhshan included dry fruits, fabrics and livestock products (Kreutzmann, 1998).

Transit trade across Badakhshan and between Badakhshan and its neighbors stopped in the 1930s for the following political reasons:

- Trade on the Chitral route sharply declined once the Afghan government placed a trade embargo on Chitral;
- The Soviet empire completely closed the border between Tajikistan and Afghanistan.

“During the past few years, the effect of Soviet policy has been to restrict, in an increasing degree, traffic, excepting state-controlled trade, from Soviet Central Asia across the Afghan frontier on the river Oxus ... more European officers were appointed to ensure that the frontier is effectively closed” (IOL/P and S/12/2275, dated 13.10.1939 in Kreutzmann 2005).

- The provision of cheaper, subsidized commodities in the kolkoz shops of Tajikistan and Kyrgyzstan caused the termination of their trading links with Kashgaria;
During the last 60 years, communities across the borders in Badakhshan have taken a very different development path and have forgotten about the regular exchanges they used to have. The level of economic development, education and health care, as well as the role of women and religion are different on both sides of the borders. In recent years, drugs’ smuggling across the border have contributed to increased mistrust between both communities. Yet, these communities share the same culture, language and beliefs and have a lot to benefit from increased exchanges through the economies of scale and an increase in market sizes. The Aga Khan Development Network (AKDN) has therefore built, between 2002 and 2006, four bridges across the Panj River in order to allow exchanges to resume. The Mountain Societies Support Project (MSDSP), a project of the Aga Khan Foundation (AKF), is complementing the bridges construction by implementing, under GTZ support, a grassroots projects that aim at developing exchanges and enhancing trusts between communities across the Tajik-Afghan
border. After the bridges across the Panj were completed, some weekly fenced-in cross-border markets attached to the bridges were set up in Ishkashim, Tem (close to Khorugh) and Ruzvai (close to Darvaz). That is where most exchanges between border communities take place (see map).

Figure 3: Border crossing and built-in cross-border market in Badakhshan (Source: Mayer 2005)

3 Project implementation

3.1 Needs identification

Following a needs assessment conducted by GTZ, MSDSP has chosen to start its pilot cross-border project in the district of Darvaz, due to the following reasons:

- On the Afghan side, Darvaz district is very remote. It takes two weeks walk to go to Faizabad, the provincial capital of Afghan Badakhshan and the nearest big town; and
The district of Darvaz receives less international support than the districts of Ishkashim and Shugnan;

The needs’ assessment conducted also showed the need for MSDSP to concentrate on two functions of the border, separating Afghan and Tajik Badakhshan:

- economic dimension: the border as an interface where goods are exchanged (legally or not) and thus generate income through taxes, bribes, etc; and

- socio-cultural dimension: the border as an interface between people, ideas, and that contributes to forge communities’ identities.

The need to focus on the economic and socio-cultural dimension of the border was prompted by the fact that (a) exchanges across the border remained relatively small since the re-openinmg of the border in 2004 and (b) the attitude towards communities across the border was often negative, and (c) communities had forgotten the regular exchanges they used to have before the 1930s.

Within that context, MSDSP has used the following tools to increase exchanges and enhance trust across the border.

### 3.2 Business development infrastructure and services

In order to support business and increase exchanges across the border, the Aga Khan Foundation Afghanistan has built on the Afghan side a warehouse that allows Afghan businessmen to store safely the goods they buy on the Tajik side.

On the Tajik side, MSDSP has set up a business incubator whose objective is to grow businesses and create jobs, with a focus on businesses having a trading link with Afghanistan, the priority being given to women entrepreneur. The business incubator is located in a government building, which testifies the strong collaboration between MSDSP and the local authorities throughout the project implementation. The business incubator support businesses both located inside and outside its premises. It supports the businesses located inside its premises with constant electricity supply and space.

It supports all its partner businesses with:

- equipment and working capital on a mix of leasing and grant base; and

- regular coaching and business training.
Training needs were identified during a needs assessment conducted by MSDSP and in pursuance the following topics were covered: start and improve your business, marketing, book keeping, cross-border legal issues, as well as specific technical trainings (on sewing, etc).

MSDSP’s intervention has addressed the biggest needs faced by Tajik entrepreneurs: lack of appropriate business space and equipment, lack of constant electricity supply, very poor business knowledge, and in general, lack of entrepreneurial thinking inherited from the Soviet Union. The biggest difficulty faced by Afghan entrepreneurs is the inconsistency of the tariffs and taxes they pay at the border, including bribes. In order to address the problem, a training on the tariffs regulating exports from Tajikistan was organized and attended by Tajik and Afghan entrepreneurs, as well as representatives of the Tajik customs department, local authorities, etc. All trainings are attended by both Tajik and Afghan entrepreneurs, and thus also contribute to create social links across the border.

3.3 Cross-border exchange events

In addition to business development activities, some social cross-border events have been organized in order to further strengthen social linkages across the border. The events target mostly women, as Afghan women rarely attend the cross-border market who have fewer chances than men to meet their Tajik counterparts. Some of the events organized included exchanging cooking and sewing skills, or business experience. Almost to 200 persons from both sides of the border, most of them women, have attended cross-border events organized in the fenced-in cross-border market locations.

3.4 Impacts

After one and half year of its inception, the MSDSP has achieved impressive results at the micro level.

- It has grown approximately to 15 businesses, and created approximately 30 jobs, 60% of which are female jobs.
- The project has not only helped increase the sales of its partner entrepreneurs, but it has also empowered them by improving their business knowledge and giving them pride in being entrepreneurs.
- The project has contributed to increase cross-border exchanges. Thanks to the project support, as some goods that were not exchanged in the past, are
now exchanged across the border. This includes goods (such as cakes), but also services such as the repair of radios and shoes. Afghan customers now have access to a bigger range of products and services than was the case when the project started, which has contributed to improve their quality of life.

– The project has contributed to enhance trust across the border, especially amongst those engaged in cross-border trade and events. The fact that one of the project partners, a Tajik business woman selling cakes on the cross-border market, is marrying her daughter to an Afghan businessman is a case in point. Here is what she says about the difference the project made to her:

“Before, I was working from home, as I did not have a business place, and I did not have the proper equipment, I was not able to buy it. I also was not able to work during the winter because there was no electricity. My income was very little. Since, I have been supported by the GTZ/MSDSP project, I have a business place, regular electricity supply during the winter, and proper equipment, which I bought thanks to leasing. My business is good, I have employed two persons. I am very proud to sell my products to Afghan customers in the cross-border market”.

4 Prospects for the future

Building on the achievements that were reached in Darvaz, MSDSP is planning to extend its activities to other Tajik-Afghan cross-border markets. In addition, MSDSP is now planning to work on creating an enabling environment for cross-border exchanges at the macro level. Needs assessment has indeed shown that the major factors hampering on exchanges were legal/political issues regulating cross-border exchanges such as the regular closure of the border, the restriction in the goods that can be traded across the border, and the difficulty for community members to cross the border, etc. To reach this goal, MSDSP will facilitate contacts between government officials on both sides of the border to discuss the benefits of regional cooperation and to look at the potential for improving it.
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5.6 Present Scenario and Future Potentials of Fruit and Herb Trade between Nepal and Tibet

Nirmal Bhattarai

Abstract

India and the People’s Republic of China are Nepal’s top and second biggest trade partners respectively. A significant proportion of the Nepal – China trade is being covered by the Tibet Autonomous Region of China. Considering three successive years’ (F.Y. 2003/04 – 2005/06) records, 64% of Nepal’s total export was directed towards India, 2.8% to Tibet and 33.2% to other countries including China. On the import front, the figures were 61.6%, 3.1% and 35.3% from India, Tibet and other countries, respectively.

Nepal and Tibet have traditional socio-economic, cultural and a well-flourished trade relationships. Majority of the trade information has not been properly documented and hence their assessment for further development has become difficult. Out of about 50 major traditional travel and trade routes between the two regions, partial records are available only from the Tatopani Custom Office in Sindhupalchok district, Central Nepal.

The limited recordings confirm Nepal’s export of fresh fruits, dry fruits, and fruit juice to Tibet while the imported commodities of the category included apple and pear. Nepal’s export of herbs included spice and condiments involved nutmeg (*Myristica fragrans*), other spices and medicinal herbs while the imported commodities of the category included ginger (*Zingiber officinale*), garlic (*Allium sativum*), jimbu (*Allium hypsistum*), other spices, herbal drugs and medicinal herbs.

Limited personal observations and recordings revealed Nepal’s export of some high altitude herbs like Yarsagumba (*Cordyceps sinensis*), Kutki (*Neopicrorhiza scrophulariiflora*), Caraway (*Carum carvi*), Bay Berry (*Hippophoe rhamnoides and Hippophoe tibetana*), May Apple (*Podophyllum hexandrum*), Kakoli (*Fritillaria cirrhosa*), Aconites (*Aconitum species*), etc. Nepal’s export of a number of middle altitude herbs like Chiraito (*Swertia chirayita*), and low altitude herbs like Harro
(Terminalia chebula), Barro (Terminalia bellirica), Satawari (Asparagus racemosus), Bojho (Acorus calamus), etc., have also been observed. On the import side, Spikenard (Nardostachys grandiflora), Jethi Madhu (Glycyrrhiza glabra), Jimbu (Allium hypsistem), etc., are noteworthy.

In many cases, Nepal has been a transition trade zone between Tibet and other countries and the magnitude of Nepal – Tibet trade is high and expanding. Fruits and Herbs trade between the two regions deserve immense potential. Instead of looking for new and prioritizing ‘distant’ markets, a wise option would be to analyze the status and evaluate the potentials of trade between these two regions considering possibilities of diversification, development, and management.

Evaluation of markets in the two regions to understand preferences of the entrepreneur and consumer communities needs attention. Possible value-additions on traditional commodities including evaluation of applicability of the value chain concept is expected to benefit both the business sphere and user communities. These could be a wise step to direct the trade relationship and business tradition for further benefit of the national economies, regional exchange and cross-border cooperation. These may also facilitate the national decision makers and policy makers in planning of development strategies and cooperation.

1 Background

Nepal is a landlocked country bordered by India in the east, south and west and by the Tibet Autonomous Region of China in the north. Out of 75 administrative districts of Nepal, 39 districts share the international boundaries, 26 adjoined with India and 15 with the Tibet autonomous region of China while 2 districts adjoined to both the countries. There has been a very faint political demarcation and close socio-economic relationships between the northern districts of Nepal and adjoining Tibetan territory. Traditionally the inhabitants of these regions are culturally as well as socio-economically intertwined with each other, having marital relations as well, in most cases.

Nepal has a pre-historic trade relationship with Tibet. The magnitude of this trade flourished most during the Indo-China war period in the early seventies when Nepal acted as a transition zone and facilitated informal trade between India and China (Tibet) through its various traditional routes. The trade between the two regions has been mostly dominated by the Nepalese traders. The markets in major Tibetan towns including Lhasa used to be dominated by the Nepalese merchants, many descendants of whom still inhabit Lhasa, Khasa, Kuti, Taklakot and
other border towns and trade centres in Tibet. Traditionally, the local inhabitants are authorized to cross each other’s territory along with personal belongings and other necessary goods without formal travel order or document and custom barriers. Hence, in most cases, the transactions of major goods are done on individual basis and the trade frequently follows the barter system. Thus a major proportion of the local-level transaction and trade remains unrecorded.

2 Trade routes

There are about 50 informal traditional routes, 20 major trade routes and 14 official custom points in existence between Nepal and Tibet in addition to many unofficial and local level trade and transaction routes. Most trade routes pass through difficult terrain and high passes. The principal trade routes are through Olangchung Gola and Hatiya in Taplejung, Lamabagar in Dolakha, Tatopani in Sindhupalchok, Rasuwagadi in Rasuwa, Larke in Gorkha, Lo Manthang in Mustang, Hilsa in Humla and Tinkar in Darchula districts. Most of these transaction points have government check posts and custom offices but official transactions through these points have been poorly recorded in Nepal except for Tatopani Custom Office in Sindhupalchok district, the largest transaction point as well as the only official source of information concerning the trade between the two regions (TEPC 2005-06).

3 Nepal-Tibet Trade: Share in Overall Foreign Trade

In official records, there is no clear-cut demarcation between the trade with Tibet and Peoples Republic of China (P.R. China). As such, many commodities exported to Tibet could be used in the Chinese mainland while the import from Tibet may include commodities from the Chinese mainland in addition to Tibet.

Custom Department records are the only authentic source of information on Nepal’s foreign trade. However, the only official record available in Nepal for the trade between Nepal and Tibet is the one recorded in the Tatopani Custom Office, Sindhupalchok district, a custom point situated at 103 kms north-east of Kathmandu and joined by a highway (Arniko Highway).

Considering the foreign trade composition of Nepal, India occupied 57.1% of the export while Tibet occupied 4.1% and the rest (38.8%) was occupied by other overseas countries including Peoples Republic of China during the Fiscal Year
2003–04. The figures for import during the same period were 58%, 2.8% and 39.2% respectively (Table 1; TEPC 2005–06).

During the Fiscal Year 2004–05, total export of Nepal included 66.6% to India, 3.1% to Tibet and 30.3% to other overseas countries including P.R. China. The figures for import during the period were 59.8%, 3.1% and 37.1% for India, overseas countries and Tibet respectively (Table 1; TEPC 2005–06).

During Fiscal Year 2005/06, India occupied 68.3% of the export while Tibet occupied 1.3% and the rest (30.4%) was occupied by other overseas countries. The figures for import during the same period were 67.1%, 3.4% and 29.5% respectively. (Table 1; TEPC 2005–06).

Table 1: Foreign Trade Composition of Nepal (F.Y 2003/04 – 2005/06)

<table>
<thead>
<tr>
<th>Direction</th>
<th>F.Y 2003/04</th>
<th>% in Total</th>
<th>F.Y 2004/05</th>
<th>% in Total</th>
<th>F.Y 2005/06</th>
<th>% in Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Exports</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>India</td>
<td>30,777,100</td>
<td>57.1</td>
<td>38,916,900</td>
<td>66.6</td>
<td>41,012,600</td>
<td>68.3</td>
</tr>
<tr>
<td>Overseas</td>
<td>20,941,661</td>
<td>38.8</td>
<td>17,691,885</td>
<td>30.3</td>
<td>18,277,759</td>
<td>30.4</td>
</tr>
<tr>
<td>Tibet</td>
<td>2,230,653</td>
<td>4.1</td>
<td>1,835,036</td>
<td>3.1</td>
<td>784,415</td>
<td>1.3</td>
</tr>
<tr>
<td>Total</td>
<td>53,949,414</td>
<td>100.0</td>
<td>58,443,821</td>
<td>100.0</td>
<td>60,074,774</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Imports</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>India</td>
<td>78,739,500</td>
<td>58.0</td>
<td>88,675,500</td>
<td>59.8</td>
<td>109,305,900</td>
<td>67.1</td>
</tr>
<tr>
<td>Overseas</td>
<td>3,866,087</td>
<td>39.2</td>
<td>55,013,730</td>
<td>37.1</td>
<td>48,086,833</td>
<td>29.5</td>
</tr>
<tr>
<td>Tibet</td>
<td>53,234,748</td>
<td>2.8</td>
<td>4,604,999</td>
<td>3.1</td>
<td>5,447,991</td>
<td>3.4</td>
</tr>
<tr>
<td>Total</td>
<td>135,840,335</td>
<td>100.0</td>
<td>148,294,229</td>
<td>100.0</td>
<td>162,840,724</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*1 US$ equivalent to about 75 NRs.
4 Fruits and Herb Trade

4.1 Trade in fruits

The record for transaction in fruits and fruit products seems highly incomplete, lacking necessary details. Available records confirm the trade in fruits between Nepal and Tibet in the following order:

Fruits worth NRs. 32,102,000, NRs. 15,823,000, NRs. 7,314,000 and NRs. 29,850,000 were exported to Tibet during Fiscal Years 2002/03, 2003/04, 2004/05 and 2005/06 respectively. Likewise, fruit juice worth NRs. 268,566,000, NRs. 26,344,000, NRs. 9,461,000, NRs. 10,811,000 and NRs. 4,368,000 was exported to Tibet during Fiscal Years 2001/02, 2002/03, 2003/04, 2004/05 and 2005/06, respectively. 17390 kg of dry fruits were exported to Tibet during Fiscal Year 2005/2006. Likewise, 17390 kg of dry/preserved fruits were exported to Tibet during Fiscal Year 2005/06 (Table 2).

On the import front, Nepal imported apple worth NRs. 53,928,000, NRs. 177,724,000, NRs. 81,901,000, NRs. 121,542,000 and NRs. 170,235,000 respectively during Fiscal Years 2001/02, 2002/03, 2003/04, 2004/05 and 2005/06 respectively in addition to10262432 kg of apples and 1314362 kg of pear during Fiscal Year 2005/06 (Table 3)

4.2 Trade in herbs and spices

Medicinal plant or herb does not belong to a taxonomic group but a use category of plant or plant products. Commonly spices and condiments are also regarded as and used for medicinal purposes. Therefore, an assessment of herbal trade between Nepal and Tibet has been attempted including medicinal herbs as well as spices and condiments.

Major items of trade in herbs and spices between the two regions included Jaiphal/Jaipatti (*Myristica fragrans*), Ginger (*Zingiber officinale*), Garlic (*Allium sativum*), Jimbu (*Allium hypsistum*), herbal drugs and Jaributi (a common term used to denote different medicinal herbs). Regarding export of herbs and spices to Tibet, 800 kg of Jaiphal/Jaipatri (*Myristica fragrans*) and 7660 kg of various other spices were exported to Tibet during Fiscal Year 2006/07. In case of medicinal herbs (Jadibuti), 108319 kg and 105916 kg were exported to Tibet during Fiscal Years 2005/06 and 2006/07, respectively (Table 2).
Nepal’s import of Ginger from Tibet was valued at NRs. 2,682,000, NRs. 17,612,000, NRs. 2,095,000, and 2,392,000 in the fiscal years 2002/03, 2003/04, 2004/05 and 2005/06, respectively. The quantity of ginger imported from Tibet during 2006/07 was 35070 kg. Likewise, 187,846 kg and 297,120 kg of garlic was imported during fiscal years 2005/06 and 2006/07, respectively (Table 3).

The import of 134,47 kg of Jimbu (Allium hypsistum) was recorded during fiscal year 2005/06. During fiscal year 2006/07, 21087 kg of other spices and 4140 kg of herbal drugs were recorded. Regarding various other medicinal herbs (Jadibuti), 402672 kg and 234763 kg were imported during fiscal years 2005/06 and 2006/07, respectively (Table 3).

Table 2: Nepal’s export to Tibet

<table>
<thead>
<tr>
<th>Fiscal Years</th>
<th>2001/02</th>
<th>2002–03</th>
<th>2003/04</th>
<th>2004/05</th>
<th>2005/06</th>
<th>2006/07</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruits</td>
<td>–</td>
<td>32,102,000</td>
<td>15,823,000</td>
<td>7,314,000</td>
<td>29,850,000</td>
<td>–</td>
</tr>
<tr>
<td>Fruit Juice</td>
<td>268,566,000</td>
<td>26,344,000</td>
<td>31,690,000</td>
<td>30,292,000</td>
<td>186,352,000</td>
<td>–</td>
</tr>
<tr>
<td>Dry/Preserved fruits</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>17390 kg</td>
<td>–</td>
</tr>
<tr>
<td>Jaiphal/Jaipatti</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>800 kg</td>
</tr>
<tr>
<td>Other spices</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>7660 kg</td>
</tr>
<tr>
<td>Jadibuti</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>108319 kg</td>
<td>105916 kg</td>
</tr>
</tbody>
</table>

Source: Department of Customs, Government of Nepal, various years
Table 3. Nepal’s Import from Tibet

<table>
<thead>
<tr>
<th>Fiscal Years</th>
<th>2001/02</th>
<th>2002–03</th>
<th>2003/04</th>
<th>2004/05</th>
<th>2005/06</th>
<th>2006/07</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple</td>
<td>53,928,000</td>
<td>177,724,000</td>
<td>81,901,000</td>
<td>121,542,000</td>
<td>170,235,000</td>
<td>168,260,280kg</td>
</tr>
<tr>
<td>Pear</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>13,143,620kg</td>
</tr>
<tr>
<td>Ginger</td>
<td>–</td>
<td>2,682,000</td>
<td>17,612,000</td>
<td>2,095,000</td>
<td>2,392,000</td>
<td>35,070kg</td>
</tr>
<tr>
<td>Garlic</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>18,784,640kg</td>
<td>29,712,070kg</td>
</tr>
<tr>
<td>Jimbu</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>13,447kg</td>
<td>–</td>
</tr>
<tr>
<td>Other spices</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>21,087kg</td>
</tr>
<tr>
<td>Herbal drugs</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>4,140kg</td>
</tr>
<tr>
<td>Jadibuti</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>40,267,200kg</td>
<td>23,476,300kg</td>
</tr>
</tbody>
</table>

Source: Department of Customs, Government of Nepal, various years

4.3 Some personal records/observations

Although official records have been documented only for the Tatopani Custom Office, there are ample evidences that a high proportion of the trade between the two regions is functional through different routes concerning various items including fruits, medicinal herbs and spices. A number of field-based information has been recorded by the author while working for various agencies like the Royal Veterinary and Agricultural University, Copenhagen, Denmark; Medicinal and Aromatic Plants Programme in Asia (MAPPA), International Development Research Centre (IDRC); Department of Plant Resources, Ministry of Forests and Soil Conservation, Government of Nepal; etc.

The present author interviewed the local collectors and district-level traders in a number of northern districts in Nepal during 1998-2004 and documented the following relevant information:

In 1999, it was recorded in Olangchung Gola, Topke Gola and Hatiya the three border villages in Taplejung district, east Nepal that the annual export of Kutki
(Neopicrorhiza scrophulariiflora) to Tibet amounted to about 10 tons, 7 tons and 9 tons, respectively during the fiscal year 1998/99. The export figures for Chirata (Swertia chirayita) from the same exit points during the same period were about 16 tons, 12 tons and 12.5 tons respectively. About 2.5 tons of snow lotus (Saussurea gossipiphora) extensively used in the Tibetan and Chinese systems of traditional medicine was reported to have been exported through the Olangchung Gola exit point.

Considerable quantities of some other low and mid-altitude herbs like Harro (Terminalia chebula), Barro (Terminalia bellerica), Satawari (Asparagus racemosus), Bojho (Acorus calamus), etc. were also recorded to have been traded with Tibet from these exit points.

Likewise, it was revealed that about 11 tons of Chiraito (Swertia chirayita) was exported by the district-level traders to Tibet via Lamabagar custom point of Dolakha district, Central Nepal during fiscal year 1999/2000. During fiscal year 1999/2000, a considerably huge quantity of Spikenard (Nardostachys grandiflora), estimated at 66 tons, was imported via the Lamabagar custom point and trade route that fulfilled major portion of the raw material requirements of about 6 privately owned essential oil distillation units established in different parts of Dolakha district. It was also informed that the Tibetan spikenard raw material contained almost double the quantity of essential oil in comparison to the Nepalese raw materials. During the same period, the Herbs Production and Processing Company Limited (HPPCL), a Government of Nepal undertaking, processed spikenard (Jatamansi) for its essential oil. Majority of the raw materials the Company purchased from local suppliers was said to be of Tibetan origin, entering Nepal via Rasuwagadi custom point in Rasuwa district, central Nepal, the information being also confirmed by the herbal traders in Bidur trade centre in the adjoining Nuwakot district.

The same tradition was recorded in west Nepal where herbs like Kutki (Neopicrorhiza scrophulariiflora), May apple (Podophyllum hexandrum), Kakuli (Fritillaria cirrhosa), Caraway (Carum carvi), Aconites (Aconitum spicatum, Aconitum bisma and other allied species), Panch Aunle (Dactylorhiza hatagirea), and fruits of wild grown bayberry (Hippophoe rhimnoides and Hippophoe. tibetana) were unofficially or illegally exported, the town of Taklakot being the destination in Tibet.

Similar observations have been recorded by the author from many other districts of Nepal adjoining Tibet. Field records also revealed that a number of herbs used to be imported from Tibet fed the Indian markets, Jethi Madhu (Glycyrrhiza
glabra) being one of the prominent examples. Likewise, medicinal plant material like Red Sandalwood (*Pterocarpus santalinus*), used in traditional Chinese and Tibetan medicines were being illegally imported from India and exported to Tibet, both import and export being unofficial and illegal.

Considering the case of Yarsagumba (*Ophiocordyceps sinensis*), an estimated 80% of the raw materials collected in various Himalayan districts of Nepal, notably Darchula, Humla, Mugu, Dolpa, Manag, etc., is said to find its way to Tibet through various routes and channels as the price offered has been exceptionally high and increasing. The same trend has also been reported from other districts of central and eastern Nepal.

**5 Future potentials**

Unfortunately, the trade between Nepal and Tibet has mostly remained unofficial, unrecorded and illegal, and, as such, the actual transaction is likely to exceed far beyond the recorded status. A full assessment of the status and extent of the trade in fruits and herbs between Nepal and Tibet has not yet been possible due to lack of information accompanied by poor record keeping systems that requires improvements including certain management practices as well. Recent studies on Tibetan medicine have shown that the earliest literature on Tibetan medicine was in the eighth century AD (Yang 1988). The Tibetan and Chinese traditional medicine is flourishing well with increasing demand domestically as well as internationally. Most of these traditional medicine sectors use Himalayan herbal materials, their need far exceeding the supply. Therefore, the market for crude herbal raw materials is ever expanding in Tibet and China. China is the second largest trade partner of Nepal, a significant proportion of this trade being covered by Tibet. At the same time, there are ample evidences that Nepal has been a transition trade zone between Tibet and other countries and hence the magnitude of this trade is high and expanding.

Despite immense opportunities for diversification and expansion, the trade has been limited to only few commodities, mostly in raw forms. Like many other commodities, Fruits and Herbs trade between the two regions is considerable and expanding with immense potentials. It is, therefore, highly desirable that instead of looking for new and prioritizing ‘distant’ markets, the foremost and wise step would be to analyze and evaluate the status and potentials of trade between these two adjoining regions considering every possible aspect of its development, diversification and management.
The future of fruits and herbs trade between the two regions is bright provided adequate attention is paid to fully evaluate the markets in the two regions together with understanding the needs and preferences of the business and consumer communities. Possible value-additions on these traditional commodities including evaluation of the applicability of the value chain concept is expected to benefit the stakeholders including the business sphere and the user communities in both the regions. This could be a wise step to direct the trade relationship and business tradition for further benefit of the national economies, regional exchange and cross-border cooperation, in addition to facilitating the national decision makers and policy makers of the two regions in planning of development strategies and cooperation.

Issues like inaccessibility, rural poverty, poor developments in roads and transport systems, shortage of employment opportunities, shortage of market information, etc., have hindered the full-fledged development in fruit, spice and herb trade in both the regions resulting in the poor economic and environmental benefits. However, recent developments in transportation and communication facilities have opened doors to refine the traditional trade pattern involving sustainable use of renewable resources, streaming of supply chain with quality products and expansion of general economic opportunities for the trading communities in general and the rural poor in particular, in both the regions.

6 References


6 Results from the Working Groups during the Kathmandu Conference

Ghulam Amin Beg

Introduction

During the conference deliberations were made on the following four thematic groups by mixed country participants: a) REC and water resource management, b) REC and Conservation/maintenance of biodiversity, c) REC and Value Chains and d) REC and enterprise Development.

Each group discussed the positive impacts (gains) expected from the regional exchange and cooperation in the respective field, kind or type of exchange and cooperation required to realise the potential gains, and who could be the actors or institutions in promoting such exchanges in the cooperating countries.

Aspects of different dimensions of regional exchange and cooperation were discussed and following results for each thematic group were produced:

1 REC and Water Resource Management

At the outset the group discussed and outlined the general framework conditions for achieving the gains in regional exchange and cooperation in water resource management: i) bilateral and multi-later agreements; ii) joint programming/strategy development; iii) development of regulatory mechanisms and iv) putting in place a monitoring system.
1.1 Gains and Positive Impacts of REC

The group discussed multiple gains as a result of promoting REC in water resource management. For example it was mentioned that REC would result in rational and responsible use of water resources. It was also highlighted that such regional level actions may result in improving knowledge/information about water resources, maximized economic efficiency of water resource use, mitigate conflicts and shall improve the eco-environment. It was also agreed that increased regional exchanges an cooperation contributes to improved human and institutional capacity, safer hydropower generation and environmentally sustainable construction of dams and reservoirs and promotes socially inclusive Management practices.

1.2 Type/Kind of REC Required realizing the Potential Gains

The group discussed the need for promoting instruments like Integrated Water Resource Management (IWRM), accumulation of water resources during drought periods, development of payment mechanisms for environmental services and rationale distribution of water and water resources.

It was also discussed that in order to exchange accurate and timely information for anticipatory planning to avoid natural disaster risks like floods and for climate change adaptation, and understanding the hydro cycles and processes in the watershed basins etc., there was a need to develop mechanisms for information exchange and management in the regional context. Early warning systems and mechanisms could be established and joint monitoring and collaborative research needs to be promoted.

In order to realize the economic potential of water resources, joint venture funds and projects may be initiated on construction of regional grids for hydropower generation and distribution involving multi-later agencies. Cyclic use of water resources and introduction of water-saving and innovative technologies promoting new concepts like water trading etc. could be explored.

For realising the potential gains in improved eco-environment, the group proposed preservation of outflow zones, integrated watershed management, control of logging of trees and cultivation and plantation in deserted areas. Improved human and institutional capacity development would require training program on water resource management for key stakeholders, exchange and exposure visits to like-minded projects and establishment of regional water regimes and organizations.
Safer hydropower erection and dams would require environmental and social compliance with internationally recognized standards and guidelines and cost and benefit sharing by all stakeholders. In order to make the use and management of water resources inclusive, there is a need to educate the people, users, right owners and managers of water resources in the public, private and community sectors.

1.3 Actors/Institutions promoting REC in respective countries

The water resource management thematic group was largely comprised of delegates from Tajikistan and Peoples Republic of China. After deliberations, the country delegates agreed on the following key actors and institutions in their respective countries:

PR China:

- Peoples Congress Standing Committee
- Development and Reform Commission
- Bureau of Water Resources
- Department of Water Resources
- Meteorology Department
- Scientific Research Centres
- Department of Finance
- Environmental Protection Department
- Enterprises
- Social Communities
- International Organizations
- Advisory Institutions
- NGOs
- Ministry of Foreign Affairs
- Agriculture Department
- Forest Department
- Water Users Association
- Educational Institutions and Departments
- Monitoring Department
- Village Committees
Tajikistan:

- Water Users
- Ministry of Water Resources
- Water Resources
- Ministry of Ecology
- Local Authority/Administration
- Ministry of Disaster Prevention
- Agency for Hydrometeorology
- Research Institutes
- Ministry of Agriculture
- Ministry of Industry
- Water Users
- International organizations
- Private Sector
- Parliament
- Advisory Institutions
- NGOs/CSOs
- Ministry of Education
- Private Educational Institutes
- Academy of Sciences
- Ministry of Energy
- Ministry of Industry
- Engineering Companies
- Community Organizations

2 REC and Conservation/Maintenance of Biodiversity

In this thematic group, the participants from China, Nepal, Pakistan and Tajikistan discussed the thematic focus in detail. Following gains or positive impacts were underscored through regional exchange and cooperation:

2.1 Gains and Positive Impacts of REC

2.1.1 Knowledge sharing

It was discussed that experiences, knowledge, ideas and information could be exchanged, which would result in increasing the knowledge and capacities of the concerned natural resource managers, as well as contribute to improvements in ecosystem management, planning, monitoring and documentation of best practices.

It was also agreed that wildlife and biodiversity resources know no political or administrative boundaries, therefore in order to protect, conserve and maintain the biodiversity resources there is a need to take a biosphere and landscape approach and share the indigenous knowledge and coping mechanisms and resilient practices of local communities across borders. In order to formalize such endeavours it was suggested to create virtual and physical networking platforms at the regional level and between cooperating countries. Collaborative research and demonstration projects, and exchange visits of practitioners, students,
researchers and policy makers were also underlined as important instruments for knowledge sharing.

2.1.2 Control on Extraction and Use of Resources

Deliberations were made on the fact that close regional exchange and cooperation in conservation field will also result in minimizing illegal extractions of resources, prohibition of illegal trade of endangered fauna and flora and would also address conflicts over resource use across borders.

2.1.3 Conservation Management

The group agreed that enhanced regional exchange and cooperation would contribute to overall conservation goals as with increased frequency of such exchanges, concrete actions and collaborative projects could spring up related to wildlife and species protection, conservation of specific eco-regions, habitats and landscapes.

Discussions were made that large areas could be dedicated for effective protection of endangered or flagship species like argali (Marco Polo) sheep in the Pamir region between Tajikistan, Pakistan, China and Afghanistan or isolated and fragmented landscapes or national parks could be connected in the case of Nepal and Tibet.

Similarly such regional exchanges and cooperation will lead to reducing risks of natural hazards, fires and pest outbreak through joint risk mapping, monitoring, information sharing and developing joint preparedness, response and mitigation mechanisms.

2.1.4 Sustainable Development

The group noted that conservation and maintenance of biodiversity would contribute to sustainable development, through promotion of eco-tourism, protection of community heritage, development of renewable products and services like non-timber forest products and medicinal plants, resulting in better income earning opportunities for local communities dependent on use of natural resources.
2.2 Type/Kind of REC Required to Realise Potential Gains

The group deliberated upon the type of exchanges and cooperation required to realise the potential gains. Following types were prioritized:

**Regional Centre**
It was suggested to create regional centres between the cooperating countries/areas/regions to promote exchange of information, monitoring of wildlife and biodiversity resources, meeting of staff and managers of like-minded institutions, promoting informal exchange with support from international organizations and exchange of relevant publications.

**Networks**
The group also proposed to develop websites and databases, create working groups or committees to meet on regular intervals, promote virtual network of protected areas and establish Trans-boundary protected area regimes.

**Policy innovations**
The group also thought it imperative to initiate policy innovations. It was agreed that regional strategy for implementation of Convention on Biodiversity (CBD), formulating common framework for cooperation and implementing bilateral agreements, political commitment of national and regional governments towards endorsement of regional policies and developing action plans and financial mechanisms to implement such policies, including seeking support from international organizations.

2.3 Actors/Institutions Promoting the Respective Type REC

The thematic group comprising China, Pakistan, Nepal, Tajikistan and delegates from ICIMOD and Inwent deliberated on the actors and institutions with the potential to promoting exchange and cooperation to promote conservation of biodiversity.

Following is the list of the country-specific actors/institutions: In China the actors and institutions listed by the group include; research institute for conservation, nature reserve management agencies, wildlife conservation association NGOs, department of forestry, government – Foreign Affairs Departments and international organizations like WWF, UNESCO and IUCN.

In Pakistan the group included actors like ministry of environment, KANA-Ministry of Kashmir Affairs, Northern Area / Northern Areas Administration, Khunjerab National Park, International Organizations: AKRSP, WWF-Pakistan,
IUCN, WCS, Karakorum International University and Local NGOs/CBOs and local communities.

In Tajikistan, actors and institutions highlighted were; Ministry of Agriculture and Nature Protection, Tajik National Park, Academy of Science and Agriculture, INGOs: AKDN, WWF, InWEnt, NGOs; Ecocentre and Pamir Grassroots NGOs.

For Nepal the actors identified include; local community, district Development Committee, Civil Society Organizations, public-private organizations and international and regional organisations concerned with biodiversity.

### 3 REC and Value Chains

The thematic group comprised of participants from China, Pakistan, Tajikistan and Nepal. The group discussed the typology of cross-border value chain looking at the specific context of mountain regions. It as agreed that different approaches and strategies are required to address the specific origination of the value chain, like value chain that originate and ends in mountain regions, value chain that originate in mountain regions, value chains that transits through the mountain regions, values chains that originates outside in main markets and ends up in mountain regions and virtual value chains.

#### 3.1 Gains and Positive Impacts of REC

For example the value chain that originates in mountain regions has remained the major focus of many development strategies. Key characteristics are high value but low volume. The potential gains include greater retention of total value and multiplier effects. However the concerns remain negative ecological consequences depending upon the type of value chain and pressures and stress on over exploitation of natural resources in fragile mountain settings.

The predominant case of value chain that transits through the mountain regions is the example of Pak-China border trade through Khunjerab Pass, which is low value but high in volume. The gains are generation of local employment in transport and related services, improved transport access and quality and increased awareness about business.
3.2 Type/Kind of REC Required to Realise Potential Gains

In order to promote value chains that originate in mountain regions, there is a need to focus on better production for market demand and promotion of first stage processing.

For value chains that transit through mountain regions the strategies may include: promotion of trade attitude, promotion of local entrepreneurship and skills training in value added trades and sectors

The general approach required to realise the potential gains include using detailed analysis of VC and markets to identify options for intervention, promotion of knowledge exchange between mountains and low lands, explore options to hook into existing value chains and creating and promoting local value chains (both traded and non traded sectors)

3.3 Actors/Institutions Promoting the Respective Type REC

The group deliberated on the diverse base of actors and institutions important for promoting value chains in mountain regions through regional exchange and cooperation. The list included: chambers of commerce, universities in concerned countries, farmers and business associations, private enterprises, NGOs promoting trade and commerce, line departments e.g. commerce dept, tourism, minerals etc., Foreign Trade Department, Export Promotion Bureau and Poverty Alleviation Offices in the provinces.

4 REC and Enterprise Development

The thematic group comprised of participants from Tajikistan, China, Pakistan and Nepal. The group deliberated on the notion of ‘enterprise’ in the mountain context and agreed that it would mean small and medium enterprises, industry (like food processing) and services (tourism businesses, hotels, trade, transport etc.).

The group also discussed the bottlenecks and constraints for enterprise development in the context of regional exchange and cooperation, notably: drug trafficking, lack of business and market knowledge, corruption in public sector mainly custom department, negative balance of trade between trading countries, complicated custom and immigration rules and procedures; language barriers,
lack of means of communication, lack of credit facility and lack of exchange of information.

4.1 Gains and Positive Impacts of REC
The group discussed both tangible and less tangible gains through regional exchange and cooperation in the field of enterprise development.

Among the potential tangible gains the group underlined: economic growth, increased income and reducing poverty, creating jobs, use of new technologies (in Pakistan Naltar hydro power station), access to bigger markets (GBAO Pamir access to western China), increased access to resources (human resources, raw materials, etc) and increase the local tax revenue (tariffs).

Among the less tangible potential gains, the group highlighted enhancing human and institutional capacities and skills, promotion of peace and stability, creating political and cultural links and promotion of understanding between partners of different countries.

4.2 Type/Kind of REC Required to Realise Potential Gains
The thematic group discussed various kinds of activities required to realize the potential gains in enterprise development in mountain regions through REC.

At the government level regular interaction between policy makers such as ministerial committees, workshops, study tours, round tables, legal cross border agreements, reform of the legal framework, continuum of government policies (stability) and taxes exemptions.

The group also highlighted others activities needed including for example cross border community exposure visits, trainings (women, etc), regional businessmen/ women forums and exhibitions, establishment of regional organizations promoting cross border ED, building trust and confidence, sharing of energy resources (hydro energy), transfer skills and technologies, financial and technical support from government and donors and exchanging information.

4.3 Actors/Institutions Promoting the Respective Type REC
The group identified the following actors and institutions with potentials to promote enterprise development in the respective countries: Among the government institutions, agencies include for example in Pakistan; Federal...
government, Ministry of NA affairs, ministry of commerce and local government. In China: department of commerce, custom department, tax collection, etc. and in Tajikistan it was the government of the Republic of Tajikistan.

Other actors and institutions identified were; businessmen and Chamber of Commerce, INGOs, NGOs, donors (AKDN agencies etc.), academic institutions (Karakoram International University, University of Central Asia), banks, communities and Civil society organizations and foreign investors.
7 Recommendations from Country Working Groups in the Field of Human Capacity Building

1 Country Group – Tajikistan

Capacity Areas
The Tajik delegation deliberated on the country recommendations in the field of human capacity building to promote regional exchange and cooperation and identified the following areas for human capacity enhancement:

Training and Capacity Building
The group identified training as a key instrument to building local human capacities. Major focus was made on i) needs analysis & training planning; ii) governance (at all levels: local, national, regional); iii) management & leadership; iv) facilitation; v) partnership and vi) developing organizational management skills.

Workshops for Entrepreneurs and Business Group
The group also prioritized arranging experience sharing workshops, learning sessions, and lecture series by notable entrepreneurs as an important area to promote entrepreneurship in the mountain regions of Tajikistan.

Trainings for Government Staff on REC
In order to enhance the knowledge base, social, managerial and technical skills of government staff, the group identified organizing both in-service, in-country training and learning exposures and placements as important area for capacity building.

Training on service provision, hospitality management and tourism was also highlighted by the group.
Partnership and Communication
The group gave specific attention to lack of human capacities that inhibit cross-border exchange and cooperation in mountain areas in terms of building partnerships and communicating to the respective actors in the border regions or countries. Therefore it was recommended to i) launch regional radio programmes; ii) organize language and Information technology courses; iii) organization of long-term specialized courses; iv) arrange international and regional conferences; v) establishment of cultural and trade representative offices and vi) creat links and partnerships between higher educational institution of Tajikistan and other mountain regions in collaboration with InWEnt and ICIMOD.

Exchange and Study Tours
For effective and sustainable regional exchange and cooperation, there is a need to promote both formal and informal contacts at various levels. This could result in improved education, knowledge and experience sharing and replication of best practices. The group identified exchange visits, fairs and exhibitions, thematic forums like forum on women development, tourism promotion etc.

Information & Resource Centres
The Tajik delegation deliberated on the current state of information and knowledge sharing across the border among the participating countries and concluded that there was a need to accelerate actions in this domain. The recommendations were; increased access to information, creation of MIS and database, creation of a REC Centre, publications (brochures, bulletins etc.) and promotion of virtual Knowledge and experience sharing hubs and portals.

Main Actors and Beneficiaries
The country group listed key actors and beneficiaries of potential capacity building actions in the future. Among the research and educational Institutions the group included i) higher educational institutions, ii) research institutions, iii) students & unemployed youth, iv) teachers/research staff, v) Centre for renewable energy and vi) University of Central Asia (UCA).

Among the government or public sector institutions those listed include; local governments officials, customs committee, Ministry of Foreign Affairs, Agency against Narcotraffic, Ministry of Agriculture & Environment protection, National Park authorities, Ministry of Economic Devt & Trade, Ministry of Transport & Communication and Ministry of Water Resources.

In the private sector the group recommended; representative of Tourism service, producers, middle-men, entrepreneurs, transport and road companies.
The civil society institutions and international organizations include; NGOs (CBOs, FBOs), Local communities groups, Women’s organizations, Pamir Eco-Cultural Tourism Association (PECTA), Milal-Inter, Micro lending organizations, NGO “Dastgiri” (Citizens Initiative Support Fund), UNDP, AKDN, WB, JICA, GTZ, ACTED, Int’l fund for Saving the Aral Sea and InWEnt, ICIMOD.

2 Country Group – China

Capacity Areas
The country group from China (Tibet and Xinjiang) deliberated on the human capacity development needs and listed following areas requiring capacity building by various actors/beneficiaries:

Management Communication Training
The group identified management and technical training intended for policy makers, managers, business people, entrepreneurs and the mountain people, as a major priority area for capacity enhancement. The specific areas listed include: Language Skills, Communication Skills, Organize Actions (Social Mobilization), Facilitation Skills, Market Exploration/Research, Marketing Skills, TOT in Organizing and delivering training and partnership and International cooperation.

The training could be organized through training workshops, in-service training and study tours for the intended beneficiaries mentioned above.

Management and Technical Training
The group also highlighted human capacity building needs in scientific management and technical training for scientists, practitioners, NGOs and supervisors. The specific areas listed include: design of management model, design of management mechanisms, collaboration management techniques, resource management skills, sustainable-use of water resources, strategic planning, exchange and collaboration of legislation, information dissemination and exchange, Training of Trainers, early warning and forecasting, scientific animal raising skills, tourism management, prevention and disaster management, renewable energy utilization, documentation of Indigenous knowledge, protection of ecological environment, agricultural processing skills and public/community participation in policy formulation.
The training could be organized through formal training sessions, personnel exchange, on site exchange, participatory learning workshop, virtual exchange and demonstration and dissemination of information.

3 Country Perspective – Nepal

The Nepali group deliberated intensively on the term ‘capacity’ and agreed that it covers using, enhancing and promoting existing human and institutional capabilities. It was also agreed that the real consideration for capacity building should be on strengthening institutional knowledge and in cementing the link between individual knowledge and institutional actions.

The group also deliberated on ‘reflective’ and ‘receptive’ attitudes related to absorption and dissemination of experiences.

Capacity Areas

The group identified following areas for capacity development was prioritized: i) human resource development planning targeted at decision makers and managers; ii) leadership development, both at regional and international levels; iii) developing change management competencies; iv) value chain management; e.g. in processing of niche products like NTFPs/ MAP and community-based tourism etc., v) enterprise development with special focus on business plan development and competitiveness; vi) managing multistakeholder processes; vi) database management and ICT Skills for REC.

The group discussed that in order to build these capacities in the above mentioned areas different means could be applied like formal training courses, action learning workshops, exposure and exchange visits, research, policy learning tools, linkage development, networking between institutions working for mountain development and organizing multistakeholder for a etc.

4 Country Group – Pakistan

The Pakistan country group focused on the mountain regions of Federally Administered Northern Areas and Chitral district in NWFP only.

Capacity Areas

The group identified various areas for human and institutional capacity building in order to promote regional exchange and cooperation in mountain areas. There were basically two cluster areas; Institutional development and human resource
development. In the institutional development domain, the group included areas like; i) change management in mountain areas, ii) networking management, iii) knowledge management focusing on education, communication and information and iv) research on regional exchange and cooperation. The target beneficiaries were identified as key institutions in the public, private and civil society including legislators, policy makers and development practitioners, community leaders/activists, natural resource managers, media personnel and researchers.

In the human resource development domain the focus was put on; training management, monitoring and evaluation, project/program management, research competencies, disaster risk management, natural resource management, value chain analysis, hotel/hospitality management, business development, vocational training for informal/non formal education, logistics management, language skills (Chinese, Russian, English, Persian) and faculty training for University particularly KIU in Gilgit. The target group was identified as students, unemployed youth, entrepreneurs, traders, teachers and researchers.

The group also recommended to promote study tours and exchange visits for legislators and policy makers to neighbouring countries and mountain regions, for researchers and practitioners to other mountain contexts, like Alps and exchange and learning visits between Protected Areas, business associations/chambers, local government representatives, tour operators, universities and research institutes, projects and programs by international agencies. The target beneficiaries include elected representatives and legislators of mountain regions, professionals of line departments, NGO staff and representatives of private sector, trade and business associations and entrepreneurs.
8 Closing Remarks by Conference Chair

Hermann Kreutzmann

When we started our work three days ago I introduced a quote by Immanuel Kant who encouraged the people of his time to increase their activities and endeavours to learn more about Central Asia. During the last two hundred years the world has changed tremendously. Since the beginning of the 21st century the challenges have been modified and the need for cooperation has been enhanced. The precondition for this is communication and the sharing of knowledge.

We are living in the so-called age of information. Some people get the impression that all information is available, but only a few people know where it is hidden.

The elaborations of the last three days have shown us that the challenge of our time is to make appropriate use of concepts and experiences. The logic of this conference drew our attention to the importance of communication and debate between different kinds of professionals. All of us put arguments forward which are based on our conceptual thinking and expertise. The gain which can be derived from working together is posing a win-win situation. Academics, policy-makers and planners as well as implementers and practitioners shared their views on pending issues.

First we identified mountain development from the national perspective which brought together colleagues from different departments. The country statements opened up our eyes for the specific challenges in individual mountain regions. As early as here we found differences and similarities.

Projecting our thoughts on thematic issues cross-country groups were formed and the discussions showed how great the need is for finding a common language in identifying issues of common interest. This precondition for regional exchange and cooperation was highlighted in all statements. The sharing of knowledge and best practices can enhance the adoption of new methodologies and strategies.
Today the important aspect of human capacity building was raised and pursuing our objectives we discussed the relationship of actors, institutions and a learning environment. These questions need to be reflected from time to time.

Juergen Richter rightly pointed out that only the adaptation to change opens the avenues for an appropriate future development. But how these changes might be configurated and are open for discussions. An enhancement of communication and knowledge-sharing does not necessarily result in the same concepts and approaches.

The experiences of the four countries during the 20\textsuperscript{th} century have created structures which for themselves have certain persistence. Local knowledge and regional expertise are embedded in those experiences and we should value these experiences.

Mountain areas are centres of diversity, not only ecologically and environmentally. The legal frameworks for economic exchange and enterprise development are quite different in respective countries. The conditions and traditions for entrepreneurship vary to a great extent. This should not only be acknowledged but it should be regarded as a resource. Every society can contribute to the endeavour of enhancing regional cooperation and exchange. No unified models have been created for pointing to future mountain development; there exist many fields for experiments and testing.

Therefore occasions like this one are important for the exchange of experiences and views. In such a manner the perception of our neighbours might be enhanced. If our conference achieved to contribute to these aspects we should be on the safe side.

Knowledge-sharing is our task. Therefore we are planning a publication of the results of this conference in electronic format and in book form. Let me remind all paper presenters that the submission of all papers is requested, that will be followed by a review process. In addition the results from the working groups are owned by all. These results will form a section of the proceedings and shall not be lost.

Therefore I would like to thank all participants for their valuable contributions, their active participation in the discussions and the creation of friendship across borders.

I would like to thank the hosts as well: ICIMOD, InWEnt and the National Planning Commission of Nepal.
9 Annexes

9.1 Conference Programme

International Conference
“Experiences with and Prospects for Regional Exchange and Cooperation in Mountain Areas”

29 November – 2 December 2007, Godavari Village Resort, Lalitpur, Nepal

Thursday, November 29th, 2007

<table>
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**Opening Ceremony**

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<tr>
<th>18:00</th>
<th>Welcome Speech</th>
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<td>Dr. Andreas Schild, Director General, ICIMOD</td>
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<td></td>
<td>Welcome Speech</td>
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<td>H.E. Mr. Franz Ring</td>
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<td>Ambassador of the Federal Republic of Germany</td>
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<td>Dr. Hans Pfeifer</td>
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<td>Director, Dep. Environment, Natural Resources and Food, InWEnt</td>
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<td>Objectives and Structures of the Conference</td>
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<td>Prof. Dr. Hermann Kreutzmann, Conference Chair</td>
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<td>Inaugural address</td>
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<td>Honorable Dr. Jagadish Chandra Pokharel, Vice Chairman,</td>
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<td>National Planning Commission</td>
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<td>Vote of thanks</td>
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<td>Dr. Madhav Karki, Member, Steering Committee</td>
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<td>19:00</td>
<td>Reception / Dinner</td>
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<td>9:00</td>
<td><strong>Introduction to the Day</strong>&lt;br&gt;Conference Chair</td>
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<td>9:15</td>
<td><strong>Key Note Addresses</strong></td>
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<td>9:15</td>
<td><strong>Geopolitical perspectives on cross-border exchange relations</strong>&lt;br&gt;&lt;br&gt;</td>
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<td>Prof. Dr. Hermann Kreutzmann, ZELF</td>
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<td>9:45</td>
<td><strong>Addressing sustainable mountain development in a time of global change:</strong>&lt;br&gt;</td>
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<td>Regional exchange and collaboration in Europe and Africa&lt;br&gt;</td>
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<td>Dr. Thomas Hofer, Prof. Dr. Bruno Messerli and Dr. Patrizio Warren, FAO</td>
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<td>10:15</td>
<td><strong>Globalisation in mountain context: Risks and Opportunities</strong>&lt;br&gt;</td>
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<td>Prof. Dr. N. S. Jodha, ICIMOD</td>
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<td>10:45</td>
<td>Tea/Coffee break and official group photo</td>
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<td><strong>Country Statements</strong></td>
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<td>11:30</td>
<td>Relevance of and trends in REC* from the country perspective&lt;br&gt;</td>
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<td>Parallel Session of Country Working Groups</td>
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<td>12:30</td>
<td>Lunch break</td>
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<td>15:30</td>
<td>Tea/Coffee break</td>
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<td>16:00</td>
<td>Presentation of Country Perspectives (Importance of REC)&lt;br&gt;</td>
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<td>18:00</td>
<td>Country Representatives + Moderated Plenary Discussion&lt;br&gt;</td>
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* Regional Exchange and Cross-border Cooperation
**Saturday, December 1st, 2007**

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<tr>
<td>8:30</td>
<td>Introduction to the Day  &lt;br&gt;Conference Chair</td>
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<td>8:45</td>
<td><strong>REC and Natural Resources Management</strong></td>
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<td>Sustainable water resources management and cross-border cooperation in the Himalayan region  &lt;br&gt;<em>Dr. Madhav Karki and Dr. Ramesh Vaidya, ICIMOD</em>  &lt;br&gt;Sustainable water resources management &amp; cross-border cooperation:  A case study on up-stream-downstream cooperation between Bhutan and India in hydropower development on the Wang river in Bhutan  &lt;br&gt;<em>Mr. Karma Phuntsho and Mr. Deo Raj Gurung, ICIMOD</em>  &lt;br&gt;Cross-border cooperation on water resources between Tajikistan, Afghanistan and China (Xinjiang)  &lt;br&gt;<em>Mr. Antatoly Kholmatov, International Aral Sea Fund</em></td>
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<td>10:00</td>
<td><strong>REC and Economic Exchange Relations</strong></td>
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<td>Facilitating regional cooperation through development of conservation corridors in the Kangchenjunga landscape  &lt;br&gt;<em>Dr. Nakul Chettri, Ms. Bandana Shakya, Dr. Eklablya Sharma, ICIMOD</em>  &lt;br&gt;Cross-border cooperation for biodiversity conservation and sustainable development in the Karakoram, Hindukush and Pamir region: case study on Pakistan, Afghanistan, China and Tajikistan  &lt;br&gt;<em>Mr. Gulam Amin Beg, IUCN</em>  &lt;br&gt;Enhancing the role of the indigenous people in natural resource management and biodiversity conservation: IFAD’s experiences in Asia and the Pacific region  &lt;br&gt;<em>Dr. Ganesh Thapa, IFAD</em></td>
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<td>11:00</td>
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<td><strong>REC and Natural Resources Management</strong></td>
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<td>Cross-border value chain and competitive advantage for mountain areas  &lt;br&gt;<em>Mr. Muzaffar Ud Din, AKRSP</em>  &lt;br&gt;Present situation and future potential of cross-border fruits trade between Xinjiang (China) and Pakistan  &lt;br&gt;<em>Prof. Dai Jian and Ms. Lu Zhaohui, XAAS</em>  &lt;br&gt;Present scenario and future potentials of fruit and herb trade between Nepal and Tibet  &lt;br&gt;<em>Dr. Nirmal Bhattacharai, ICIMOD</em></td>
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| 12:30 | **Enabling conditions for promoting regional economic cooperation in the Mainland of South Asia**  
*Dr. Golam Rasul and Dr. Kamal Banskota, ICIMOD*  
**Opportunities for enterprise development and regional cooperation in Himalayan region**  
*Dr. Dyutiman Choudhary and Dr. Kamal Banskota, ICIMOD*  
**Cross border exchanges and enterprise development: a case study of Badakhshan**  
*Ms. Marielle Leseur, MSDSP* |
| 13:15 | Lunch Break                                                            |
| 14:30 | Facilitated Parallel Working Groups on specific issues  
– Introduction to Working Groups |
| 15:30 – 18:00 | Parallel Working Groups (Including Tea/Coffee Break) |
| 19:00 | Dinner                                                                 |
### Sunday, December 2\textsuperscript{nd}, 2007

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<th>Time</th>
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| 8:30  | Introduction to the Day<br>
*Conference Chair* |
| 8:45  | Presentation of working group results                                                   |
| 10:45 | Tea/Coffee Break                                                                        |

#### Capacity Development for REC

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| 11:15 | **Experiences and strategies for capacity development: The InWEnt Perspective**<br>
*Mr. Juergen Richter, InWEnt* |
|       | **Experiences and strategies for capacity development: The ICIMOD Perspective**<br>
*Dr. Madhav Karki, ICIMOD*     |
| 11:45 | Potential contribution of capacity development on REC and recommendations<br>
*Working Groups*                |
| 13:30 | Lunch break                                                                             |
| 15:00 | Presentation and discussion of working group results and recommendations                 |
| 16:00 | Summary statements<br>
*Country representatives*       |

#### Closing Ceremony

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| 17:00 | Conference Summary and Farewell<br>
– *Chairperson*<br>
– *ICIMOD*<br>
– *InWEnt*<br>
– *National Planning Commission* |
| 19:00 | Dinner                                                                                  |
9.2 List of Participants

International Conference
“Experiences with and Prospects for Regional Exchange and Cooperation in Mountain Areas”
29 November – 2 December 2007, Godavari Village Resort, Lalitpur, Nepal

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<tr>
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**China (Tibet)**

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**Special Invitees for Opening Ceremony**

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