ICIMOD

Summary Report

of

Consultative Technical Workshop on High Altitude Wetlands in the Hindu Kush-Himalayas

International Centre for Integrated Mountain Development
Kathmandu, Nepal

December 2009

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Note: The report was prepared by Bishnu B. Bhandari with assistance from Pradeep Mool and Celeste Harris under the guidance of Hua Ouyang & Eklabya Sharma**.** For suggestion and improvement, please contact Bishnu B. Bhandari at bbhandari@icimod.org

The workshop was held at the following place and time.

Date: 3-4 December, 2009
Place: ICIMOD, Kathmandu, Nepal
Organizer: ICIMOD
Participants: 41 from six countries (Bangladesh, Bhutan, China, India, Nepal & Pakistan) & ICIMOD

1. Recommendations of the Workshop

The Consultative Technical Workshop on 'The High Altitude Wetlands (HAWs) in the Hindu Kush-Himalayas" was held in Kathmandu from 3-4 December 2009. The Workshop was organized by the ICIMOD and attended by 41 participants from six regional member countries (Bangladesh, Bhutan, China, India, Nepal and Pakistan), international organizations (IUCN, Wetlands International, WWF), research institutions and academia.

The participants highly commended ICIMOD for organizing this technical consultation for promoting the role of HAWs in the HKH region. Taking into account the suggestions and recommendations of various previous workshops held under the framework of Himalayan Wetland forum (from *Urumqi ,2002 to Kathmandu, 2008)* and *Delhi Declaration on HAWs and River Basin Management* (2008), the participants unanimously called upon ICIMOD; its regional member countries; international organizations particularly WWF, Wetlands International and IUCN; NGOs; civil society and academia for taking the following urgent actions for conservation and sustainable development of HAWs in the HKH region:

1. Support the efforts of the Ramsar Convention Secretariat for securing the endorsement of the concerned contracting parties of the region and strategic partners for the formalization of the Himalayan Wetlands Initiative (HWI);

2. Promote integration of conservation and wise use of HAWs into river basin management and HKH transect initiative, and develop model initiatives;

3. Promote research to support conservation and management of HAWs;

4. Undertake efforts to bridge science-policy divide and linking local culture and traditional knowledge for conservation of HAWs and their ecosystem services;

5. Develop mechanisms to improve the effectiveness and efficiency of communication, education, participation and awareness (CEPA) on HAWs;

6. Develop mechanisms for strategic environmental impact assessments to support decision making regarding developmental projects which have the likelihood of impacting HAWs and their ecosystem services;

7. Encourage, document and disseminate traditional techniques, best practices, lessons learnt and successful examples concerning the wise use of HAWs in the region;

8. Encourage the use of science in understanding HAWs;

9. Develop mechanisms to enable integration of views, rights and capacities of local communities so that maintenance of their livelihoods is ensured while conserving overarching role of the HAWs;

10. Notwithstanding the gaps in existing science and knowledge on wetlands in general and HAWs in particular, promote integration of conservation and wise use of HAWs into climate change mitigation and adaptation policies and strategies , including strategies for reducing vulnerabilities induced on local livelihoods;

11. Develop cross-sectoral wetland governance and management approaches for wetland management as the HAWs transcend the borders of different sectors, disciplines, agencies and ideologies;

12. Support development of national wetlands policy in the HKH region which adequately address HAWs and their ecosystem services ; and in countries where the policy exists, undertake efforts for incorporation of new research and lessons learnt;

13. Encourage strategic partners, academia, NGO and research institutions to help governments develop and implement management plans for HAWs;

The participants request the ICIMOD, Ramsar Secretariat, participating international organizations and experts to disseminate and promote its results within appropriate fora, partners and mechanisms in the HKH region.

4 December 2009
Kathmandu, Nepal

2. Background

The Himalayas are the **water tower** of Asia, containing the largest natural freshwater storage structure in the continent. With the most abundant coverage of ice, snow, permafrost, glaciers and glacial lakes outside the Polar Regions, the Himalayas are now being referred to as the **Third Pole**. The Himalayas are also the **headwaters** of 10 most important rivers of Asia. The region provides important ecosystem services such as provisioning, regulation, cultural and support services. Due to their unique characteristics in the Himalayan landscape, wetlands of this region are being categorized as a "special" category of wetland.

In the Hindu Kush-Himalayas, there are many wetlands above 3,000 m, which are called High Altitude Wetlands (HAWs). These wetlands are remote and characterized by climatic adversity, thus they are highly vulnerable to predicted changes in climate particularly due to global warming. Available studies show that glaciers are retreating; glacial lakes are shrinking while others are enlarging due to rapid snowmelt. Besides these glacial changes, HAWs and their catchments are suffering from many other factors such as natural land subsidence, glacial lake outburst floods, pollution, over-use of resources and human encroachment. These factors are both natural and induced by human activities. The Himalayan wetlands are fragile and therefore their protection and conservation should be the main agenda affront us in order to maintain the livelihoods of the millions of people living downstream and depending on these systems.

This workshop is an attempt to understand current efforts on, and challenging issues relating to the management and conservation of HAWs in the HKH region, and to identify possible future actions for their management, conservation and sustainable development.

3. Goal & objectives

The goal of the workshop is to promote cross-learning and identify possible activities for both national and regional collaboration, to enable the management and sustainable use of the HAWs in the HKH. This aim has been further divided into three major objectives, which are as follows.

1. *Share information, experiences and challenges related to the management and sustainable uses of HAWs*
2. *Develop partnerships for Research & Development (R&D) on HAWs*
3. *Identify the means and actions for collaboration.*

4. Outputs

Expected outputs include the following;

1. Knowledge, data and information shared
2. Summary report of the workshop
3. Mechanisms for collaboration identified
4. Outline of suggested activities for collaboration

5. Overview

The workshop was structured into 4 plenary sessions, two break-out sessions and one session on strategic exercise. A Newari dinner-*cum*-cultural program was organized at Wunjala, Naxal. The workshop was inaugurated and closed by Dr. Madhav Karki, Deputy Director-General of ICIMOD with a brief welcome remark from the participants of Nepal and a vote-of-thanks from a participant from China. The titles of various presentations, and respective authors are presented in Box A.

Box A: List of papers and authors	
1. Bishnu Bhandari, Celeste Harris, Hua Ouyang, Eklabya Sharma & Pradeep Mool	1. High Altitude Wetlands in Hindu Kush- Himalayas
2. Nakul Chettri, Bandana Shakya and Eklabya Sharma	2. Why Hindu-Kush Himalayan Region is Important for Biodiversity Conservation?
3. Tek Bahadur Gurung	3. Prospects of cold fisheries in the HAWs
4. Hem Sagar Baral	4. Importance of the HAWs for Protection of Avian Diversity in the HKH
5. Humaira Khan & Richard Garstang	5. Issues, Constraints and Challenges of HAWs in Pakistan
6. Archana Chatterjee	6. Impact of climate change on the conservation of HAWs
7. Zhang Xiaohong	7. Conservation of Peatlands in the HKH: Experiences from the Tibetan Plateau
8. Ritesh Kumar	8. Efforts in integrating HAWs with river basin management
9. Ritesh Kumar	9.Livelihoods improvement and poverty reduction through wetland activities
10. Luo Peng & Sun Geng	10. Interface between wetlands and rangelands on Ruoergai Plateau, China
11. Pradeep Mool *et al.*	11. Greater Himalayan Wetlands Information System: Implication for the conservation of HAWs.
12. Bed Kumar Dhakal	12. Management of HAWs in the PAs: Experiences from Nepal

The workshop was attended by 41 participants from 6 countries and ICIMOD. As mentioned above, there were 12 submitted papers and some 24 organizations were represented in the workshop. The list of participants is presented in **Annex A**.

Table 1: Papers by country, participants & organizations represented

No	**Country**	**Total participants**	**Total papers**	**Organizations represented**
1.	Bangladesh	1	-	1
2.	Bhutan	2	-	2
3.	China	5	2	3
4.	India	3	3	3
5.	Nepal	16	3	14
6.	Pakistan	1	1	1
7	ICIMOD	13	3	-
	Total	**41**	**12**	**24**

Independent researchers = 4 Ratio of female to male = 1:5

Attendance: Maximum = 57 and minimum = 23

The statistics related to Questions and Answers (Q&A) show that participants made 69 interventions during the plenary session. Gender-wise, the number of interventions made by female participants was almost 50% even then the number of female participants was one for every five male participants. Slightly higher number of participants made their interventions on the third plenary or the second day presentation. See Table 2 for detail information.

Table 2: Facts and figure on Q&A

Session	Male	Female	Total
One	15	12	27
Three	10	3	13
Four	22	7	29
Total	**47**	**22**	**69**

The Workshop adopted a 13-point recommendation for the management and conservation of high altitude wetlands in the HKH (**See Annex B**).

6. General observations

1. The workshop was enlightening and creative because of the diversity of papers/presentations and the combination of sharing from the natural sciences and social sciences. As well as this, the diversity of wetland types discussed ranging from peatlands to rangelands to riverine wetlands, enabled a diverse learning environment.

2. The HKH region is 3,500 km long from east to west with great variation from arid to wettest areas. It covers the area of 3.5 million km^2. As it is the headwaters of the ten big rivers (Tarim, Amu Darya, Indus, Ganges, Brahmaputra, Salween, Irrawady, Mekong, Yangtze and Yellow) and contains 12,000 km^3 of freshwater (more than that of Lake Superior), the area is called the **Water Tower** of Asia. Snow and glaciers cover about 33,000 km^2 and permafrost underlies the area, not covered by glaciers. The glaciated area is the largest one outside the poles. Therefore the area is called **Third Pole**.

3.

4. Snow (cryospheric area) and grass (rangeland) are the two dominating features in the Hindu Kush-Himalayas. Cryospheric land means water is in solid forms including lake ice, snow cover, glacier, ice caps, ice sheets, frozen ground and permafrost. It houses glaciers, glacial lakes, pond, glacial rivers, snow fields, ice area etc. Rangeland refers to expansive, mostly unimproved lands covered by native grasses, grass-like plants, forbs (broad-leaved plants) and shrubs. Large rangeland is found in the northern side of the Hindu Kush-Himalayas. It houses wet meadows, permafrost, peatlands, lakes, ponds, bogs, mires, etc.

5. Recently, the Himalayan wetlands are undergoing major changes. For examples, during the 2001-2009 period, the number of lakes has decreased from 2,323 to about 1,600 but the coverage of the area has increased in Nepal. Regular updates are needed to derive a concrete conclusions related to wetland change in the region.

6. The HKH has a total of 29 Ramsar sites including 14 sites at the high altitudes.

7. The HKH region has high "*meta and beta*" diversity (in terms of ecosystems, habitats and species and their interaction at the landscape level).

8. Trans-Himalayan transect is an initiative for establishing a regional approach for long term ecological research and environmental monitoring for ecosystem and river basin management, climate change adaptation and sustainable development in the Hindu Kush-Himalayan Region. The Initiative is a monitoring, data exchange and sharing technology and regional polity innovation. The trans-Himalayan Transect Initiative builds upon the concept of regionally agreed upon and identified regional level "Transects"- a sampling unit and includes the concept of nested Transboundary Landscape Complexes within it as focal points for in-depth studies and action research. The Transects (sampling corridors) are delineated to be representative of conditions and variability among various gradient along the HKH. The trans-Himalayan Transect concept could enhance our understanding of change whilst assisting decision making and planning mechanisms for the region. This concept is being promoted by ICIMOD. The Initiative works at three levels; data generation, strategic and policy actions, and development. The Initiative goes vertically north-south. Important Trans-Himalayan Transect complexes from the west to east are (1) Wakhan, (2) Karakoram, (3) Kailash, (4) Everest, (5) Kanchanjungha, (6) Brahmaputra-Salween, and (7) Cherapunjee-Chitagong.

9. There is a clear lack of wetland related data in the region, and those that do exist are scattered and difficult to access. In addition, HAWs appear to be the least studied of these environments.

10. The HKH region houses 115 endemic species including 80 endangered animals. The region supports the population of endangered blue sheep and the Himalayan thar. The HKH hosts parts of the four global biodiversity hotspots, (1) Mountains of Central Asia (2) the Himalayas, (3) Indo-Burma, (4) Mountains of South-West

China. Of the ecoregions in the HKH, 29 sites are in global 200 ecoregions and 12 are critically important in terms of endemism, species richness and intensity of threats.

7. Major points

1. HAWs are distributed globally. However, the number of Ramsar sites are concentrated more in Neotropic Ramsar region and then in the Asia region. Some 14 sites are found in the HKH.

2. Among the wetlands, HAWs are the least studied systems.

3. HAWs have significant cultural, spiritual, religious, economic and hydrological significance. They are the frontiers of regional cooperation, as many are transboundary systems. They are also important buffer zones for flood hazards.

4. Cold water fisheries are possible in HAWs as long as the O_2 is not at a fatal level. *Kimura*, a species of fish is recorded in as high as 3,000 m above sea level in the Dudhkoshi River of Nepal. The rainbow trout has been successful breed in Nepal and Brown trout is being breed in Bhutan. Snow trout, Golden Mahaser and Copper Mahaseer have potential for high altitude fisheries. Fisheries tourism brings multiple benefits to the community.

5. From an Avian point of view, the region is the gateway for continental migration of birds enabling stages of their life cycle, including staging point, breeding ground and wintering place. The region houses 330 IBA's (Integrated Bird Areas) recording 126 globally threatened and 85 near-threatened species. The globally threatened species found in the region are (1) Baer's pochard, (2) Baikal teal, (3) marbled teal, (4) black-necked crane, and (5) wood snipe. About 14 species are dependent on, and 67 are associated with, HAWs. The common species are the bar-headed goose, Ruddy shelduck, common merganser, great-crested grebe and bar-headed goose.

6. In the mountains, climatic conditions vary more sharply with elevation and over shorter distances than they do with latitude. An economic valuation of goods and services is required at both upstream and downstream levels. In Ladakh (north-west India) , snow melts begin earlier and winter is shorter: this affects river regimes, natural hazards, water supplies, people's livelihoods and infrastructure, locally as well as further downstream.

7. Peatlands are found in the Ruoergai, eastern Tibetan Plateau. Peat is the long term accumulation of organic material. It comprises more than 90% water and thus has a unique ability to store large amount of water. Peatlands are composed of meadow soil and mire soil. The Ruoergai area provides breeding grounds for the black-necked crane, a globally threatened species. Climate change and human actions (especially growing nomadic populations, unplanned development, charcoal mining, haphazard drainage and livestock farming) have enormous impact on peatlands resulting in desertification of the area and soil degradation.

Soils are being replaced by meadow soils and even aeolian sandy soil. Pasture degradation has included a decrease in grasslands, invasion by exotic plants, rodent damage and the emergence of a "black-soil" type. In order to prevent further degradation of peatlands, local populations have been engaged in ecotourism. This alternative livelihood option has been successful to reduce the population of the yak and at the same time, it has been successful to increase the quality of yak production.

8. The Ruoergai rangelands house vast areas of peatlands, wet meadows, bogs, mires, permafrost and glaciated areas. The Ruoergai area is the headwater of the Yellow River. Some 3 million yaks, 2 million sheep & goats and 120 thousand horses graze on the meadow in summer and on the peatland in winter, when the area is covered with snow. They browse Kobresia, Juncus etc. and the oil from foraging in these plants protects them in winter. Local people report that yaks become sick if they spend prolonged periods of time in the peatlands which would thus lead to the assumption that yaks may not play a major role in peatland destruction. Nevertheless, peatlands have undergone degradation. The major drivers of these changes are livestock pollution, artificial drainage, over grazing and climate change. Over grazing has given rise to problems such as spreading of rodents, expanding of sand dunes and growth of unpalatable grasses.

9. Permafrost (also called permafrost soil) is one of the common features of high altitude wetlands. It is the soil or rock that remains below the freezing point for 2 or more years and forms when the ground cools sufficiently in winter to produce frozen layers. Permafrost is found at high latitudes or high altitudes. The largest expanse of high altitude permafrost in the world is found in the Tibetan Plateau. Permafrost ranges from a few meters to about a hundred meter in depth and has been found above 4,150 m above sea level particularly in alpine grasslands to meadows. Permafrost contributes to wetland formation by retarding the downward movement of soil water. Permafrost has undergone some degradation in the past years within the region. It is very sensitive to climate change and its depletion has led to changes in the water and heat transition mechanisms of local soils, which affects the structure and functions of an ecosystem. The degradation of permafrost has resulted in shrinkage of wetland area, land desertification and thus deteriorated ecosystems (such as alpine marshes, wet meadow and alpine lake).

10. Major achievements on wetlands in Nepal include the designation of three Ramsar sites at high altitudes. The site management plan of Gokyo, which was prepared in collaboration with buffer zone institutions, is already in place. Major issues in the management of HAWs include lack of information, poor coordination and poor institutional mechanisms. Growing poverty, ecological fragility and instability, deforestation and inappropriate farming practices are the major threats to the integrity of HAWs.

11. The Greater Himalayan Wetland Information (GHWI) System is a database which has information at four levels; river basin, sub-basin, wetland complex and

wetland habitat. The system consists of three major components; database, meta-database and interactive web-system. The GHWIS may provide a useful system for the storage and dissemination of wetland data in the region. The system is housed by ICIMOD. At the moment, the database is in beta version and only partners can have access to it. It will be available to member countries and others only after the process of branding is completed.

12. Rivers and their surrounding catchments are categorized as riverine wetlands. The riverine wetlands originating from the HKH are transboudary in nature. The upstream wetlands provide water sources and flood protection. The downstream wetlands are also a source of freshwater and provide local goods and services such as fish, agriculture and research. The connectivity between upstream and downstream is critically important for the maintenance of ecosystem services. It is important to maintain the environmental flow of the riverine wetlands when human interventions are made. Major suggestions for their conservation include the establishment of appropriate mechanisms to bring together all the major groups in the management of the entire basin.

13. Livelihoods include people's values, aspiration and material needs for living. Traditionally Lake Loktak of India was managed for fisheries, aquatic vegetation and agriculture. Now eco-tourism has been introduced. Wetland management planning needs to strike the balance between ecological and socioeconomic assessments. Skills and opportunities need to be diversified to enable various livelihoods. Governance mechanisms need to address conflicts and promote vertical and horizontal institutional developments.

8. Suggestions

1. HAW is a functional unit and should be seen in the broader context of landscape, or basin levels.

2. Adequate data are required for appropriate planning and decision making in HAWs. Linkages should be developed between research, policy and development.

3. Hardware and software are not enough to conserve wetlands. "Heart-ware" is essential in their management and conservation.

4. Scientific uncertainties about HAWS need to be reduced.

5. Information about endemism should be included in databases.

9. Challenging issues

1. Unmanaged grazing resulting in over-grazing.

2. Ill-managed tourism and recreation
3. Change in land use and habitat alternation
4. Global warming and its impacts
5. Socio-cultural pollution and sedimentation
6. Deforestation
7. Overuse of resources
8. Low capacity of line agencies

10. Results of the break-out sessions

Group One: *How can we promote R&D on HAWs?* (**Chair**: Archana Chatterjee, India)
By developing and implementing the following activities:

- Inventorying with minimum information on biodiversity, ecology, culture, etc.
- Understanding ecosystem functions and services (water storage, carbon cycle, CO_2, carbon funding)
- Creating a tool for inventory, assessment & monitoring
- Developing management tools (Vulnerability assessment, SEA of development project particularly, mining, nomadism, fishing, impact indicators mainly species, culture, ecosystem processes.)
- Development of a rapid appraisal technique
- Managing resource use conflict
- Determining the impact of movement, nomadic, transhumance, etc.
- Livelihood assessment
- Incorporating indigenous peoples and knowledge
- Community-based tourism
- Defining the role of regulatory approaches
- Undertaking demonstration projects
- Undertaking regional macro-economical studies (economic valuation, payment for ecosystem services, cost of inaction, incentive system & trade off, sustainable financing, value chain, tourism, fisheries, etc.)
- Developing CEPA tools, materials and methods.

Group Two: *How can we strengthen the partnerships?* (**Chair**: Humaira Khan, Pakistan)
1. What is collaboration?
Collaboration means bringing together interested partners for a common purpose. The basis for a sustainable collaboration is to “know about them, the issue & purpose”.

2. Mechanism of a sustainable partnership

- Sharing of data, information, knowledge & resource

- Capacity building (training, joint proposal, research project, exchange of experts, etc)
- Formation of a forum
- Networking for a common purpose
- Regional exchange program

3. Suggested actions

- Transboundary sites
- Upstream-downstream linkage
- Common priorities
- Linking with regional projects
- M&E
- Documentation of works
- Lobbying and advocacy
- Developing sharing mechanism

4. Possible stakeholders

- GO/NGOs/INGOs/CBOs/IGOs
- Quasi-governmental organizations
- The private sector (business & industries)
- The media
- University, schools, research institutions
- Professional organizations
- Informal network (practitioners & promoters)
- Religious leaders

11. Findings of the strategic exercise

This is the summary of strategic exercise moderated by *Diedrek Prakke and* summarized by Bishnu Bhandari.

Issue: The regional organization: Role, area of cooperation and activities for future

1. Major role

1. Coordinate collaborative/joint works with GOs, IGOs, NGOs, and NGOs
2. Provide links with member countries, partners, donors and others
3. Act as a nodal point for cross-country and cross-cultural communication and information sharing.
4. Serve as a clearing house mechanism and HAW hub
5. Help set up network of wetland site managers and experts
6. Help procure funds
7. Maintain the pool of experts and resources

2. Possible areas of cooperation

1. Management of GHWI system and database
2. Develop regional inventory, strategy and guidelines

3. Study on trans-boundary sites (such as basin, IRBM, landscape, Himalayan transect, landscape level etc.)
4. Regional meetings, workshops and exchange programs (experts, practitioners, materials etc.)
5. Set up of networks of individuals, experts etc.
6. Review of the existing treaties and agreement between nations
7. Twinning of wetlands
8. Establishing a HAW award (honor) system
9. Study on migratory birds, flyway and roosting areas
10. Studies on the area of conflicts and war

3. Suggested activities

Basic tools & mechanism	Knowledge generation	Capacity building	Outreach activities
1. National inventory of HAWs 2. Establishing a lose informal networks of agencies, organizations & individuals 3. Preparing rapid appraisal tool kit 4. HAW guidelines & strategies 5. Monitoring & assessment techniques	1. Case studies 2. Impact of human actions 3. Studies on socio-cultural aspects 4. Cold water fisheries 5. Limnological studies 6. Economic valuation and payment for ecosystem services 7. HAW dependant people 8. Poverty, livelihood & local knowledge 9. Climate change, adaptation & mitigation[1]	1. Training 2. Strengthening institutions such as CBOs & NGOs 3. Providing technical assistance 4. Exchange program 6. Pilot project 7. Regular interaction program 8. Educational materials	1. Sensitization 2. Awareness raising program 3. Diffusion of best practices 4. Newsletters 5. Encourage traditional technology 6. Information sharing forum 7. Providing incentives/innovation 8. Income generating activities 9. Scaling up activities 10. Advocacy & lobbying

11. What do we make of it?

The conservation of HAWs is a complex issue and thereby requires active and well-informed participation from all concerned partners and stakeholders. In order to promote the cause of the HAWs, ICIMOD is committed to do the following in relation to wetlands;

1. Continue to work on the interface between natural and social sciences, policy and practices, and promote regional cooperation.

2. Adopt the Ecosystem Approach for the sustainable development of wetlands.

3. Support communities to improve their livelihoods and enhance their resilience.

[1] Specific activities include *vulnerability assessment, measurement of carbon emission, timing & magnitude of warming, impact of permafrost on peatlands, carbon cycling*, etc

Annex A: List of Participants

	Name	Country	Organization	Address	Email	Telephone/fax
1.	Sanowar Hossain	Bangladesh	Bangladesh POUSH	Bangladesh POUSH, 10/10 Iqbal Road, Mohammedpur, Dhaka 1207, BANGLADESH	sanowarb@bangla.net	Tel: +880-2-8112430
2.	G. Karma Chhopel	Bhutan	NEC	PO Box 466, NEC,Thimpu, Bhutan	gkchhopel@nec.gov.bt	Tel: +975-2-323384 +975-2-17624118
3.	Lhendup Phukba	Bhutan	WWF-Bhutan	Kanchanjangha , PO Box 210, Thimpu, Bhutan	plhendup@wwfbhutan.org.bt	
4.	Archna Chatterjee (Ms)	India	WWF-India	Himalayan Glaciers, Rivers and High Altitude wetlands, Programme172-B Lodi Estate, New Delhi 110003 INDIA	achatterjee@wwfindia.net	Tel: +91-11-41504815 Fax: +91-11-41504779
5.	Ritesh Kumar	India	Wetlands International – South Asia	A-25, 2nd Floor, Defence Colony, New Delhi 110024 INDIA	ritesh.kumar@wi-sa.org	Tel: +91-11-24338906 Fax: +91-11-24338906
6.	Durga Das	India	Director - Pallishree	Bhunbanesor, Orrisa INDIA	pallishree137@hotmail.com	
7.	Humaira Khan (Ms)	Pakistan	Wetland Biologist - Pakistan Wetlands Programme	House # 3, Street # 4, Sector F-7/3, Islamabad, PAKISTAN	humkhan@hotmail.com	
8.	Lu Xiangou	China	Wetland Ecology & Environment	Northeast Institute of Geography and Agriecology, CAS, Cahncun,130012 P. R. CHINA	lux@neigae.ac.cn	Tel: +86-431-85542216
9.	Zhang Kun	China	Wetland Ecology & Environment	Northeast Institute of Geography and Agriecology, CAS, Cahncun,130012 CHINA	zhkunlx@a63.com	Tel: +86-431-85542216
10.	Zhang Xiaohong	China	Wetlands International China	501 Room,Grand Forest Hotel,3A Bei Sanhuan Zhonglu Road,Beijing, 100029 P.R. CHINA	zxh@wetwonder.org	Tel: +86-10-62377031 Fax: +86-10-62077900

11.	Luo Peng	China	Chengdu Institute of Biology	CAS, Chengdu, 610041, China	luopeng@cib.ac.cn	Tel: +86-28-85220065
12.	Sun Geng	China	Chengdu Institute of Biology	Chengdu Institute of Boiology,CAS, Chengdu, 610041, P. R. CHINA	sungeng@cib.ac.cn	Tel: +86-28-85220065
13.	Neera S. Pradhan (Ms)	Nepal	WWF Nepal	Baluwatar, Kathmandu, NEPAL	Neera.pradhan@wwfnepal.org	Tel: +977 1 4434820
14.	Tek Bahadur Gurung	Nepal	NARC	NARC, Khumaltar, Kathmandu, NEPAL	tek_fisheries@hotmail.com	Tel: +977-1-4262570
15.	Tej Kumar Shrestha	Nepal	TU, Zoology	Central Department of Zoology, Kirtipur, TU	drtks@ccsl.com.np	Tel: +977-1-427-9748
16.	Hem Sagar Baral	Nepal	Himalayan Nature	Gyandeep Marg, Lazimpat, Kathmandu, NEPAL	hem.baral@gmail.com	Tel: +977-9851019751 Fax: +977-1-4444527
17.	Ratna S. Rana	Nepal	Board member	CEDA, TU, Kirtiput, NEPAL	ratnasjbrana@gmail.com	Tel: +977-1-4432938
18.	Tirtha Bahadur Shrestha	Nepal	Life member	Nepal Academy, NEPAL	tirthabshrestha@gmail.com	Tel: +977-1-5521258
19.	Mohan B. Kayastha	Nepal	Free lancer	Baneswor, Kathmandu, NEPAL	mohan_nima@infoclub.com.np	Tel: +977-1-4470049
20.	Bed Kumar Dhakal	Nepal	Department of National Parks and Wildlife	P.O. Box 860, Babarmahal, Kathmandu, NEPAL	bedkumar@gmail.com	Tel: +977-9841461563
21.	Tek Bahadur Shrestha	Nepal	Professor	CNAS, Tribuhvan University	tek_cnas@yahoo.com	Tel: +977-1-427-9748
22.	Laxmi Amatya	Nepal	Project Manager,	IUCN, Nepal, PO Box 3923, Kathmandu, Nepal	amatya@iucn.org.np	Tel: +977-1-5528-781
23.	Prabhu Budathoki	Nepal	Independent Researcher	Koteswor, Kathmandu, NEPAL	prabhu@wlink.com.np	
24. .	Geeta Bhakta Joshi	Nepal	Professor	Institute of Engineering	gbeejoshi@hotmail.com	Tel: +977-1-554-3072
25.	Poonam Rana (Ms)	Nepal	Reader	Culture Department, TU		Tel: 977-1-4431-843
26.	Ratna Raj Timsina	Nepal		NTNC		Tel: 977-1-5526-571
27.	Puspa Lal Pokhrel	Nepal	Lecturer	MRM Campus, Ilam	Puspalal.pokhrel@yahoo.com	Tel: 98490-80-333
28.	Bisheswor Subedi	Nepal	Economist	RiDA	bishesworsubedi@yahoo.com	98510-58329
	ICIMOD staff					

29.	Madhav Karki	Nepal	ICIMOD	GPO Box 3226 Kathmandu, Nepal	mkarki@icimod.org	Tel: +977-1-5003222 Fax: +977-1-5003277
30.	Hua Ouyang	Nepal	ICIMOD	GPO Box 3226 Kathmandu, Nepal	houyang@icimod.org	Tel: +977-1-5003222 Fax: +977-1-5003277
31.	Eklabya Sharma	Nepal	ICIMOD	GPO Box 3226 Kathmandu, Nepal	esharma@icimod.org	Tel: +977-1-5003222 Fax: +977-1-5003277
32.	Pradeep Mool	Nepal	ICIMOD	GPO Box 3226 Kathmandu, Nepal	pmool@icimod.org	Tel: +977-1-5003222 Fax: +977-1-5003277
33.	Bishnu Bhandari	Nepal	ICIMOD	GPO Box 3226 Kathmandu, Nepal	bbhandari@icimod.org	Tel: +977-1-5003222 Fax: +977-1-5003277
34.	Arun Shrestha	Nepal	ICIMOD	GPO Box 3226 Kathmandu, Nepal	abshrestha@icimod.org	Tel: +977-1-5003222 Fax: +977-1-5003277
35.	Mandira Shrestha (Ms)	Nepal	ICIMOD	GPO Box 3226 Kathmandu, Nepal	mshrestha@icimod.org	Tel: +977-1-5003222 Fax: +977-1-5003277
36.	Nakul Chetri	Nepal	ICIMOD	GPO Box 3226 Kathmandu, Nepal	nchettri@icimod.org	Tel: +977-1-5003222 Fax: +977-1-5003277
37.	Diederik Prakke	Nepal	ICIMOD	GPO Box 3226 Kathmandu, Nepal	nchettri@icimod.org	Tel: +977-1-5003222 Fax: +977-1-5003277
38.	Bandana Shakya (Ms)	Nepal	ICIMOD	GPO Box 3226 Kathmandu, Nepal	bshakya@icimod.org	Tel: +977-1-5003222 Fax: +977-1-5003277
39.	Anuja Joshi (Ms)	Nepal	ICIMOD	GPO Box 3226 Kathmandu, Nepal	ajoshi@icimod.org	Tel: +977-1-5003222 Fax: +977-1-5003277
40.	Finu Shrestha (Ms)	Nepal	ICIMOD	GPO Box 3226 Kathmandu, Nepal	fshrestha@icimod.org	Tel: +977-1-5003222 Fax: +977-1-5003277
41.	Sarita Joshi (Ms)	Nepal	ICIMOD	GPO Box 3226 Kathmandu, Nepal	sarjoshi@icimod.org	Tel: +977-1-5003222 Fax: +977-1-5003277