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Indus FOREVER

Indus for All Programme

Marshalling ideas & efforts to safeguard the Indus Ecoregion

Glimpses of July 2008 - June 2009

Indus for All Programme

The journey towards a prosperous Indus ecoregion

With the introduction of Global - 200 in 1997, WWF embarked on a new approach of conserving biological diversity and ecological processess around the world. The approach involved addressing a broader range of issues and partnerships on a larg er landscape level.

As part of Global 200 the ecoregion conservation journey in Pakistan began with the Indus Ecoregion, which is one of the 238 ecoregions in the world and also among the five which exist in Pakistan.

The basis for Indus Ecoregion Programme is a study titled "Root Causes of Biodiversity Loss in Mangrove Ecosystem" conducted in 1999. This was followed by a rigorous consultative process in 2002 and 2004 towards making the Indus Ecoregion Plan.

The first six-year implementation phase of the Indus Ecoregion Programme started in 2006 and is known as the Indus for All Programme, which marks the beginning of the journey for ecoregion conservation in Pakistan.

Acronyms

BDRO	Badin Development and Research Organisation
BMP	Best Management Practices
CBA	Cost Benefit Analysis
CBO	Community-based Organization
CCB	Citizen Community Board
DCC	District Coordination Committee
DPO	District Police Officer
DUV	Direct Use Value
EE	Environmental Education
EEMS	Environmental Education Model School
EPA	Environment Protection Agency
FAO	Food and Agriculture Organization
GEF	Global Environment Facility
GDP	Gross Domestic Product
GIS	Geographic Information System
HSBC	Hong Kong and Shanghai Banking Corporation
IESC	Indus Ecoregion Steering Committee
IUCN	The World Conservation Union
IUV	Indirect Use Value
JMWDO	Jhole Mari Welfare and Development Organization
LDP	Livelihood Development Plan
KMWDO	Keenjhar Maroara Welfare and Development Organization
MAF	Million Acre Feet
MNA	Member of the National Assembly
MoE	Ministry of Environment
MoU	Memorandum of Understanding
MPA	Member of the Provincial Assembly
NFP	National Forest Programme
NGO	Non-governmental Organization
NNP	Net National Product
NPV	Net Present Value
NRM	Natural Resource Management
NTFPs	Non-timber Forest Products
NUV	Non-use Value
PCRET	Pakistan Council for Renewable Energy Technologies
PE	Poverty Environment
PES	Payment for Environmental Services
PFTC	Partnership Fund's Technical Committee
PIUs	Project Implementation Units
PMU	Programme Management Unit
PRSP	Poverty-Reduction Strategy Paper
P&DD	Planning and Development Department
RBOD	Right Bank Outfall Drain
SANDEE	South Asian Network for Development and Environmental Economics
SCIESC	Sub-committee of the Indus Ecoregion Steering Committee
SDPI	Sustainable Development Policy Institute
SIDA	Sindh Irrigation and Drainage Authority
SNAs	Systems of National Accounts
TEV	Total Economic Value
UNDP	United Nations Development Programme
WAPDA	Water and Power Development Authority
WWF - P	World Wide Fund for Nature, Pakistan

Government of Sindh's Perspective

I am happy to know that the Indus for All Programme is entering the third year of its implementation. Implemented by WWF Pakistan in close collaboration with government, academia and civil society organizations the Programme has made significant progress in achieving its targets over the last two years. The visible impact of the Programme would not have been possible without the support and cooperation of various organizations.

As Chair of the Indus Ecoregion Steering Committee (IESC), I am fully aware of the various components and activities of the Indus for All Programme. The IESC provides valuable guidance and support to the Programme through its diverse committee members.

The Programme's various new initiatives such as promotion of renewable energy through provision of solar and wind energy; establishment of farmer field schools; promotion of best management practices among farming communities; energy plantations and natural resource based enterprises will not only reduce pressure on the already degraded natural resource base but will also serve as a model for other stakeholders interested in conservation and poverty alleviation.

I hope that this year with the implementation of Livelihood Development Plans and Natural Resource Managements Plans, the Programme will be able to, not only, provide alternate livelihoods to local communities, but also, diversify the community livelihood base.

The process of social mobilization and awareness-raising in local communities with the support of community based organizations is impressive and I hope that this social capital will be harnessed to promote the sustainable use of natural resources among local communities.

Mainstreaming environment in national/provincial and sector development planning is also a significant initiative of the Programme. The Partnership Fund is an additional and vital component of the Indus for All Programme. Partners from government, civil society and academia can leverage the Partnership Fund, which provides support through grants for the implementation of nature conservation projects. I hope that the projects supported so far will contribute significantly to the conservation of natural resources.

The Government of Sindh assigns high priority to the environmental conservation. Currently, the Government of Sindh is implementing the Sindh Costal Community Development Project. This is a US $40 million project assisted by Asian Development Bank and is targeted at providing income to the inhabitants of the coastal areas of Thatta and Badin Districts. It also aims to improve environmental conditions to promote a sustainable income resource base and improve local living conditions

In order to provide clean drinking water to people and also to restore the fresh waterlakes in Sindh, the scheme namely, "Feasibility study and remedial measures for restoration of lakes and other water bodies in Sindh" has been initiated at the cost of Rs. 500 million.

The Government of Sindh has involved a range of community organizations and NGOs in an array of development interventions. About 25 project proposals of civil society organizations costing Rs. 261 million have been finalized with the Chief Minister's approval. These interventions range from healthcare; education; water and sanitation, and income generation schemes among others.

I assure you that the Government of Sindh will continue to extend full support and cooperation to the Indus for All Programme during the upcoming years of implementation, especially in obtaining wide support from all stakeholders with proven experience in the areas of livelihoods enhancement and biodiversity conservation and management.

I wish you success in your future endeavors.

Nazar Hussain Mahar
Additional Chief Secretary (Development)
Government of Sindh
Karachi

Views of the Embassy of the Kingdom of the Netherlands

It gives me great pleasure to contribute to the opening chapter of the second annual report of the Indus for All Programme. Though my stay with the Embassy of the Kingdom of the Netherlands in Pakistan is very short I have had significant interaction with the Programme which included a short visit to the WWF - Pakistan's Wetland Centre in Sandspit, Karachi to meet the Indus for All Programme team.

The Embassy of the Kingdom of the Netherlands has high expectations from the Indus for All Programme and now that the Programme is entering into its third year of implementation we are hopeful that benefits should be reaching to the stakeholders of the Programme such as local communities and local government. In this respect I am pleased to see that some of the initiatives of the Programme are starting to bring results. Indeed it is very encouraging to see that grassroots institutions such as community-based organizations have been registered and are starting to receive conservation and development projects from donors, including the Partnership Fund of the Indus for All Programme.

It is also encouraging that the Programme has installed some technologies on the ground to bring some benefits to the community whilst addressing the issue of natural resource management. Incentives such as community managed biogas units, wind turbines and solar are good example's of how new technologies can affect the lives of rural communities, while reducing some of the burden on the dwindling natural resources such as forests. Additionally, it is good to see that the Programme has also started to rehabilitate some of these forest habitats such as mangrove forests at Keti Bundar.

The extensive environmental education outreach activities already conducted by the Programme are commendable. Investing in educating the youth and students of the Indus Ecoregion is, I am convinced, an important contribution to the 50 year ecoregion vision, since today's youth are tomorrow's managers of the ecoregion's natural resources.

Finally, I hope that the Programme will continue to succeed in their efforts and in doing so also address important issues such as revision of policies relevant to natural resource management, developing measures to help communities adapt to climate change and perhaps most importantly addressing the issue of water security in the Indus Basin. I wish the Indus for All Programme team the best of luck!

Jan Maas
First Secretary, Environment and Water
Embassy of the Kingdom of the Netherlands
Islamabad.

WWF Pakistan's View point

WWF - Pakistan enjoys a strong presence in Sindh through the implementation of its Indus for All Programme. Ranked among the largest programmes, WWF - Pakistan is directly involved in implementing the Indus for All Programme that represents a significant component of our conservation activities in major parts of Sindh Province in general and to that in districts Thatta, Shaheed Benazirabad and Sanghar, in particular.

Over the years, WWF has utilised a variety of methods to prioritise its activities. Currently WWF's Global Programme Framework acts as an outline strategy for our future work. It guides the development of a portfolio of programmes that focus on conserving priority places and species and by addressing humanity's Ecological Footprint and priority drivers. The Indus for All Programme is one component of this collective vision. It reflects a provincial effort to protect a regional priority area i.e. the Indus Ecoregion, which is one of 41 Priority Places for the global WWF Network. The Programme consolidates our past and continuing efforts in environmental conservation, protection of biodiversity, ecological management and support to the rural poor in terms of decreasing their reliance on natural resources.

The success of the Programme's conservation and livelihood development initiatives symbolises WWF - Pakistan's belief that diversification of livelihoods makes for engaged communities, which in turn results in people viewing their environment not just as an economic asset but as a part of their heritage. However, this heritage requires vigilant stewardship if it is to be enjoyed by future generations. It is no longer possible to think of the environment in isolation from people. Successful conservation is a holistic endeavour. It requires the support and enthusiasm of not only environmentalists and ecologists but also ordinary people and government officials. The Indus for All Programme with the support of the Government of Sindh harnesses the energies of these different groups for the conservation and revitalisation of Sindh's ecological heritage.

Ali Hassan Habib
Director General
WWF - Pakistan

Achieving Programme Goals - A Prologue

The Indus for All Programme has just completed its second year of implementation (July 2008 June 2009). During this time the Programme has built on its past successes in priority sites, has reinforced its existing partnerships while developing new ones, and has engaged in innovative research. This has been accomplished by the support of the Programme's partners and field offices. The Government of Pakistan has declared 2009 as the Year of the Environment. We, at the Indus for All Programme, think this recognition has come not a moment too soon. The success of our 50 year vision for the Indus Ecoregion is predicated on government and citizens taking an active role in conserving the Indus Ecoregion.

During this reporting period the Programme has witnessed growing awareness among communities and other allies about the importance of diversifying livelihoods and providing economic opportunities instead of relying solely on one type of natural resources for livelihood. In order to anchor this awareness among beneficiary communities, the Programme has developed strategic participatory natural resource management plans and livelihood development plans after extensive consultations with partner communities and local government departments. These plans will be implemented in all four priority sites (Keti Bunder, Keenjhar Lake, Pai Forest, and Chotiari Reservoir). The livelihood development plans are designed to identify actions for improving livelihood opportunities by building the capacity and improving the skills of local communities, especially in developing market access.

The Programme has continued to build its reputation as a publisher of high quality research related to habitats, biodiversity and other ground breaking work such as valuation studies of five ecosystems, poverty-environment indicator study for all sites and an ongoing study, supported by the Food and Agriculture Organisation and the Ministry of Environment, to develop national guidelines for the valuation of forest and non-timber forest products.

Numerous publications, ranging from posters to pamphlets to manuals have been developed under the environmental education and awareness component. Other products are in the process of being finalized, including: a floral guidebook for Sindh; farming manuals for adopting Better Management Practices, and a manual for conducting poverty-environment studies

The community-based organizations; our key partners; continue to mature and have demonstrated initiative and taken over greater responsibilities including administering the site based vocational centers to local women CBO groups; maintaining solar and wind power units at Keti Bunder and Keenjhar Lake; overseeing the construction and management of bio-gas units at all four priority sites

The Friends of the Indus Forum, a platform for advocacy and public outreach, is active. Meetings are well-attended and the roster of members has increased over the last year. Members of the forum contribute regularly to major English and Urdu dailies as well as regional media. The forum is also developing a discussion paper on the ecological impact of insufficient water on the Indus Delta. This paper will be a valuable lobbying tool as the Programme continues to draw the attention of parliamentarians to the plight of the Indus Delta. The Programme is keen to encourage 'green' parliamentarians from across the country to visit ecological hotspots in the Indus Ecoregion thereby creating environmental awareness among policy-makers and leveraging their interest to relieve the poverty-environment pressures in the region.

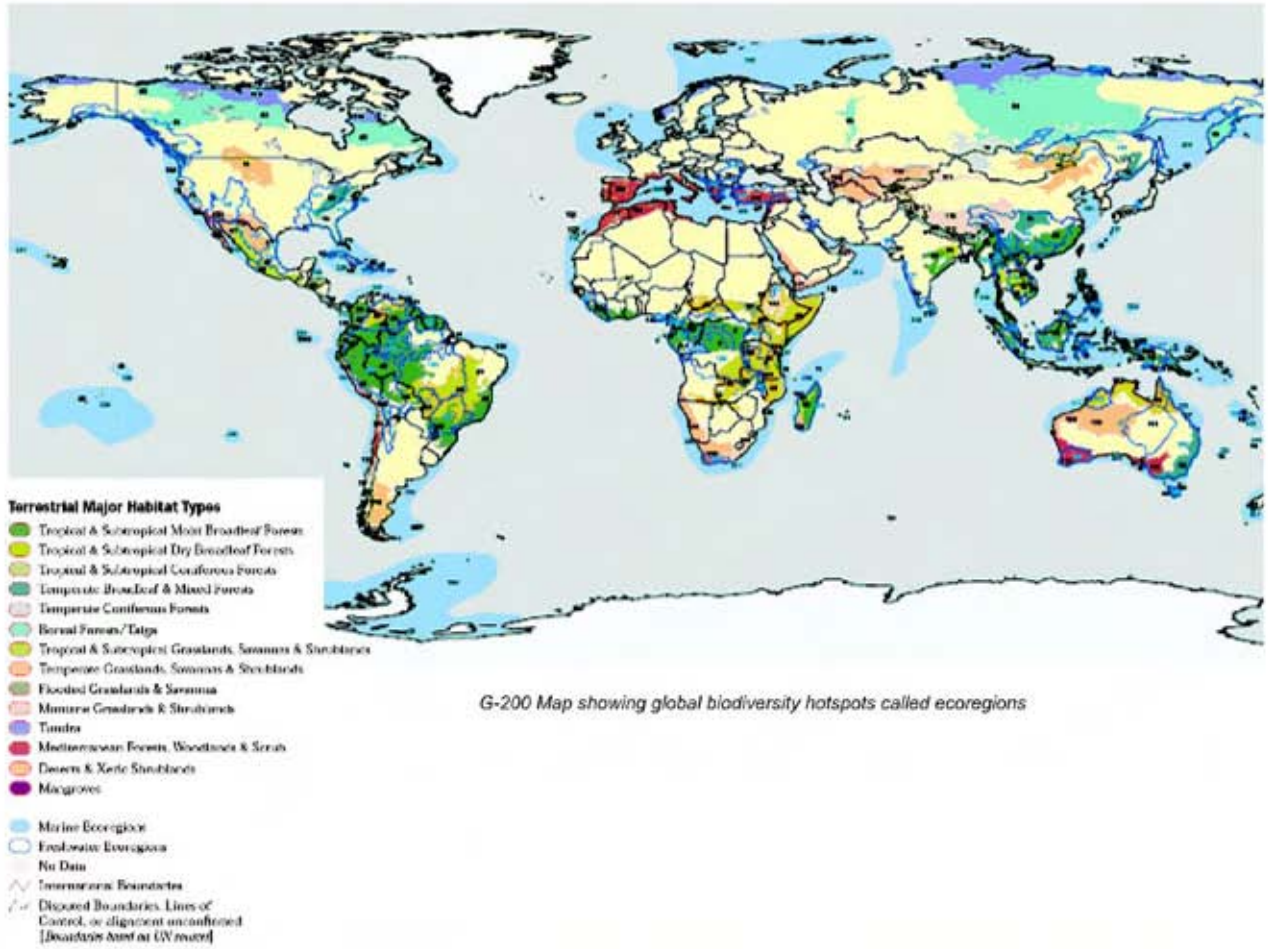
The Programme has also undergone its first monitoring mission. The Embassy of the Kingdom of the Netherland's sponsored external monitor was tasked with evaluating the Programme's practices and achievement in light of international standards. The monitor spent a few days meeting staff and partners in Karachi before visiting the Programme sites and interacting with partners there. Confident of the quality of work, the team was able to satisfy the monitor. Overall the visit was a fruitful one and we are determined to continue to build on our successes.

Dr. Ghulam Akbar
Team Leader
Indus for All Programme

What is an Ecoregion?

WWF defines an ecoregion as a large unit of land or water containing a geographically distinct assemblage of species, natural communities and environmental conditions within which important ecological and evolutionary processes interact.

Ecoregion conservation is a broad scale, integrated approach that aims to conserve and, where necessary, restore the full range of biological diversity of an entire ecoregion. This approach provides an opportunity to develop a vision and devise a strategy for a larger area over a longer period of time.



G-200 Map showing global biodiversity hotspots called ecoregions

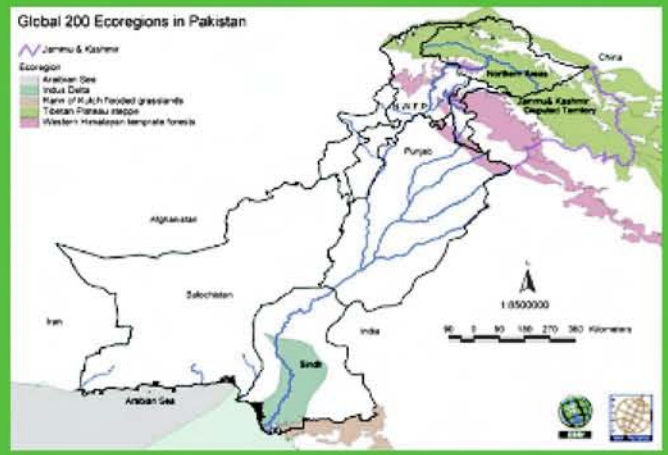
Global 200 Ecoregions

In 1997, the World Wide Fund for Nature-International (WWF) with support from other scientific institutions such as the United Nations Environment Programme, Birdlife International and the National Geographic Society carried out a scientific analysis of the most biologically diverse and representative ecoregions in the world. This study resulted in the selection of the Global 200 ecoregions: 238 terrestrial, freshwater and marine ecoregions. These ecoregions conserve more than 95 percent of all species and most habitats on Earth. This unique assessment provides a blueprint for biodiversity conservation on a global scale. The Global 200 Ecoregions have been scientifically prioritized to reflect their ecological significance and representation of our planet's biodiversity richness.

A view of Keenjhar Lake: the largest freshwater lake in Pakistan

Importance of the Indus Ecoregion

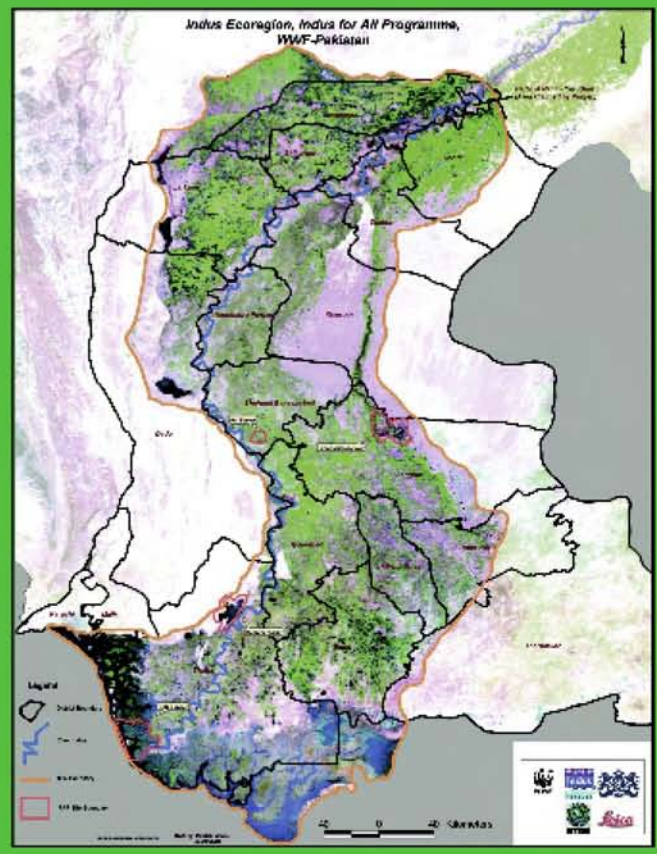
The Global 200 analysis identified five ecoregions in Pakistan: Western Himalayan Temperate Forests, Tibetan Plateau, Rann of Kutch, the north Arabian Sea and the Indus Ecoregion. The Indus Ecoregion is the only ecoregion that lies fully within Pakistan's boundaries, while all the other ecoregions are trans-boundary. It is one of the forty most biologically significant ecoregions in the world and the most prioritized ecoregion falling within Pakistan.



The Indus Ecoregion covers approximately 65% of the Sindh province, comprising 23 districts while a small northwestern part extends slightly into the Balochistan province. The Ecoregion draws its name from the Indus River, which is one of the largest rivers in the world. The Indus River is an important source of freshwater in Pakistan- agriculture, forestry, fisheries, hydropower and various industries are directly dependent on the river's water supplies.

The Indus provides mineral-rich soil and water to its floodplains, harboring riverine forests along the river banks and mangrove forests in the delta region. There are several freshwater and brackish lakes created by run-off from the river and beyond lie the desert ecosystems. The Indus Flyway is a globally recognized route for migratory birds from Siberia and Central Asia. There are concerns, however, that extensive deforestation, industrial pollution, sea water intrusion and global warming are affecting the vegetation, agriculture and wildlife of the Indus Ecoregion.

The ecological significance of the Indus Ecoregion led WWF - Pakistan to concentrate the majority of its efforts on this Ecoregion. The successful planning and lessons from the Indus Ecoregion Programme will provide a platform for developing conservation programmes in other ecoregions in Pakistan.



Freshwater wetlands are the most significant ecosystem within the Indus ecoregion

History of the Indus Plains

The people of the Indus Ecoregion represent one of the earliest civilizations of the world, the Indus Valley civilization. The flood plains of the Indus have been extremely fertile and more than 4,500 years ago, this is where the ancient Indus civilization originated. Excavations reveal that there were two main cities: Mohenjodaro and Harrapa, located three hundred and fifty miles apart. Besides these cities, there were several other smaller towns. The inhabitants of the Indus built canals and used the water for irrigation.

Their towns were exceptional in that, they were laid out on a rectangular grid system and the streets were lined and populated with double storied houses made of burnt bricks. Then the nomadic Aryan tribes invaded India around 1500 BC, destroying the Indus Valley civilization and killing its inhabitants.

Much later were the Arab Muslim invasions of Sindh. In the 7th century, Mohammad Bin Qasim established the first Muslim presence in this region. Later Islam spread through out this area through the Sufi saints who preached love and tolerance. Many were buried in the vast Makli necropolis, located near the city of Thatta. This region is also home to one of the world's largest forts, called Rani Kot. This gigantic fort was used by the Talpur kings who ruled Sindh from 1783 to 1843. Their sand stone tombs embellished with intricate carvings, are found all across Sindh.

A tomb in Makli-the largest graveyard in the region, represents the cultural richness of the Indus ecoregion

People and Wildlife of the Indus Ecoregion

The riverine, desert and coastal ecosystems of the Indus Ecoregion harbor a rich diversity of flora and fauna, some of which are endemic to the ecoregion. For example, the blind Indus Dolphin is a unique endemic mammal of the Indus River. The freshwater lakes like Keenjhar, Haleji, Manchar and Baqar and the coastal wetlands like Narreri, Jhubo, Mehro, Sanhro and Pateji all generate valuable goods and services for dependent communities. The scenic Haleji wetland has been referred to as a 'bird's paradise' by visiting dignitaries while Keenjhar Lake is the major source of drinking water for the city of Karachi.

Riverine forests and swamps along the River Indus provide an ideal habitat for Hog deer

The diverse ecosystems in the region are home to different species, from marsh crocodiles in the Nara Canal to Hog Deer which are found in the riverine forests. Over 100,000 migratory water fowl sightings have been recorded at the larger lakes. In the salt and brackish wetlands- flamingos, ducks, waterfowls, crocodiles and otters have been recorded.

In the sea-water creeks of the Indus Delta, many species of marine dolphins, whales and porpoises have been recorded. In addition, about 200 species of fish have been recorded. Two

Blind Indus Dolphin, an endemic mammal of the River Indus

Species of marine turtles; Green and Olive Ridley, frequent the shores of the Karachi coast for nesting. Sandspit beach is a globally important turtle nesting beach.

Mat making from typha grass

The local communities who live in the Indus Ecoregion are dependent on their natural resources for survival. These communities are mostly fishermen, mat makers and small agriculturalists who own livestock. The local people say that due to decreased freshwater in the Indus River and seawater intrusion, their lives have become very difficult.

Threats to the Indus Ecoregion

Over the years, a series of dams and barrages have tamed the once mighty Indus River as it weaves its way from the mountains to the Arabian Sea. The river's decline has been devastating to those living along its banks in the south. Not only is there less fresh water in the river, the environment is also threatened by increasing pollution, illegal hunting and logging, climate change, unchecked population growth and weak governance.

Mangroves uprooted by sea intrusion in Chann creek

The mangrove forests are fast disappearing in the coastal areas. Four out of the eight mangrove species found in the Indus Delta have become extinct. Presently *Avicenna marina* is dominating the mangrove vegetation in the delta. Among fauna, some of the more threatened species in the Indus Ecoregion include: the Hog Deer, Chinkara, Palla Fish, Marsh Crocodile, Gavial, Smooth Coated Otter, Indus Dolphin, Green turtle, Marbled Teal duck, Houbara Bustard and vultures. Indigenous tree species, which are facing threats due to logging in the riverine forests, include Kandi, Gugar, Lohero and Bahan.

Coastal communities are frequently affected by sea storms

The unabated use of pesticides and the dumping of domestic and industrial waste into water bodies have also led to negative impacts on human and ecosystem health. Increasing population has also induced pressure in the form of conversion of natural forests and wetlands to agriculture and other uses. These practices are resulting in habitat shrinkage, fragmentation and loss of biodiversity. Fisheries resources are also facing the severe threat of over-exploitation due to the use of destructive and illegal fishing nets. In addition, the World Bank sponsored Left Bank Outfall Drain has polluted freshwater lakes and wetlands in the region and increased salinity, destroying the livelihoods of the local people. It is feared that the Right Bank Outfall Drain project which is currently being implemented, will cause even more environmental damage. Already, the first part of the project, RBOD-I, has poisoned Manchar Lake, the largest freshwater lake in Pakistan by dumping industrial effluents and sewage into the lake. If no remedial actions are taken, the Indus Ecoregion may fast approach an ecological disaster.

Objectives of Indus Ecoregion Programme

Today there exists a 'window of opportunity' which consists of an integrated approach to heal the wounds inflicted upon nature as a result of misuse, weak governance systems and non supportive policies. The Indus Ecoregion Programme is such an opportunity for collaborative actions taken by different stakeholders to reverse the process of environmental degradation in Sindh. The Indus Ecoregion Programme focuses on species, habitats, ecological processes and sustainable use of natural resources.

Conceived on the principles of sustainable and participatory management, the Indus Ecoregion Programme provides a framework of integrated actions to meet the challenges of environmental degradation in the province. The fundamental elements for the success of this Programme include a wider stakeholders' ownership, a desire to reform governance and policies and an aspiration to initiate collective actions. These actions have been positioned within a 50 year vision with specified targets for medium and longer periods.

A series of workshops, consultations and other extensive efforts by WWF - Pakistan together with the Government of Sindh and various stakeholders culminated in the development of the Indus for All Programme. The overall objectives of this Programme, as a first phase of the Indus Ecoregion Conservation Programme, is to ensure improved natural resource management in the Indus Ecoregion which will contribute to improved livelihoods and sustainable development. The idea is to conserve key ecosystems in the Lower Indus Basin, while protecting human health and livelihoods.

The Programme is much needed and welcomed and it requires wider stakeholders' ownership and a strong commitment towards the adoption of collaborative and participatory actions. Currently funded by the Embassy of the Kingdom of the Netherlands, who have also generously contributed to its design, the Indus for All Programme is now in the first 6 years of the 50 years vision of the Indus Ecoregion Conservation Programme

The Dutch Ambassador HE. Tjeerd F. De Zwaan visiting the Wetlands Centre at Sandspit, Karachi

Turning Vision into Reality

In 2006, a 20 members steering committee chaired by the Additional Chief Secretary (Dev) of the Sindh Planning and Development Department, was constituted. This multi-stakeholder forum provides overall guidance for the mainstreaming and alignment of the Indus Ecoregion Conservation Plan into sectoral priorities and reviews its implementation and progress. Other members of the committee include provincial secretaries of relevant departments such as Forestry and Wildlife, Environment, Livestock and Fisheries, Irrigation and Power and Finance and the heads of the Coastal Development Authority and Sindh Irrigation and Drainage Authority. Representatives from academia, Planning Commission of Pakistan, and civil society organizations such as the Pakistan Fisher Folk Forum, IUCN and UNDP Small Grants Programme are also included.

The Indus for All Programme is currently working in four of the fourteen priority sites identified under the Indus Ecoregion Conservation Plan. Interventions by government partners are also contributing to achieving the targets and milestones formulated under the plan. During its current phase, the Programme is operating at four sites of the Indus Ecoregion representing critical ecosystems in Thatta, Sanghar and Shaheed Benazirabad (Nawabshah) districts. Through the small grants programme, it is also providing funding to selected partners in the ecoregion in order to implement biodiversity conservation and livelihood diversification projects.

An Indus Ecoregion Steering Committee meeting held in Karachi

Programme Implementation

The Indus for All Programme is being implemented according to the 3M approach. This participatory governance approach links changes at the local level (micro) with changes at the district and provincial level (meso) and national levels (macro) in an effort to synchronize the lessons from the field and community ambitions with policy-level decisions.

The Indus for All Programme began implementing the priority interventions identified by the Indus Ecoregion Programme in July 2006. According to the planned timescale there was a 9-month inception phase from July 2006-March 2007, followed by a 5-year project implementation phase from April 2007-March 2012. This will be followed by post-project implementation planning till June 2012.

At present the Programme is focusing on four priority sites: Keti Bunder (deltaic ecosystem), Pai forest (riverine forest ecosystem), Keenjhar Lake (freshwater ecosystem) and Chotiari reservoir (desert-freshwater ecosystem). The Programme Implementation Units (PIUs) are based in all four sites with its project staff working with local communities. The project staff also coordinate with the Programme Management Unit (PMU) based in Karachi.

In addition to these activities, the Programme is currently funding a number of partnership projects through its small grants fund (Partnership Fund). The partnership fund financially supports partners such as government departments, NGOs, academic institutions and local communities to implement projects addressing conservation, biodiversity and livelihood improvement.

3M Approach

Micro (Communities, Union Council Levels)	**Meso** (District and Provincial Levels)	**Macro** (National & International Levels)
Role of Citizen Community Boards and Village Councils	Lesson learning and dissemination from micro level	Upscalling of lessons to influence decision-making processes
Identifying poverty-environment based NRM solutions	Mainstreaming of poverty-environment linkages in planning	Alignment of required interventions at all levels
Capacity building of local NGOs and CBOs	Capacity building of Executive District Officers (EDOs)	Support for required governance and institutional structures

Mr. Mazhar-ul-Haque Siddiqui, the Vice Chancellor University of Sindh and Ms. Humera Alvani, Member Provincial Assembly and Programme staff during the Annual Stakeholder and Networking meeting held in Hyderabad

During the first two years of the programme, livelihood and natural resource management plans were prepared for all the four sites. Studies included socio-economic baselines, poverty profiles, ecological assessments and poverty-environment linkage reports. A GIS lab was established and various persons trained in GIS.

A detailed traditional ecological knowledge study of the Indus Ecoregion was completed and a communication and awareness strategy developed. The Programme's website (www.foreverindus.org) was developed and is operational. Additional studies included a Nara canal survey and a comparative study of riverine ecosystems.

A view of community participants in a Programme activity

Organizing the Local Communities

One of the first steps during the Programme's implementation was to organize communities so that they could implement future projects themselves. The initial social mobilization process took an entire year and the Programme continues to encourage this process of organizational maturity. During this time a number of Community-Based Organizations (CBOs) were formed at each of the priority sites. The CBOs were sensitized to the environmental issues in their areas in addition to receiving organizational development trainings. Community partners were soon celebrating significant environmental days like World Environment Day and helping the project staff at the four sites in organizing medical camps and livestock vaccination camps. As part of the capacity building, the CBOs were trained in management, preparing project proposals, and the sustainable natural resource use. They were also taken on exposure visits to other sites. The programme staff advocated CBO self reliance and helped them in preparing livelihood development concepts and in networking with the relevant government departments and local NGOs. Partner CBOs have also been registered with the Community Development Department, which grants them legal status, thereby strengthening these grass roots institutions. .

CBOs in the Indus for All Programme Sites

Site	No. of villages	Existing CBOs	New CBOs	Total CBOs	MoUs signed	Registered
Keenjhar	38	02	07	09	09	09
Pai – Forest	23	09	07	16	14	07
Chotiari	30	04	05	09	09	08
Keti Bunder	31	03	06	09	09	08
Total	**122**	**18**	**25**	**43**	**41**	**32**

Wetlands of the Ecoregion provide refuge to a variety of migratory and resident bird species

Wildlife and Habitat Survey: 2009

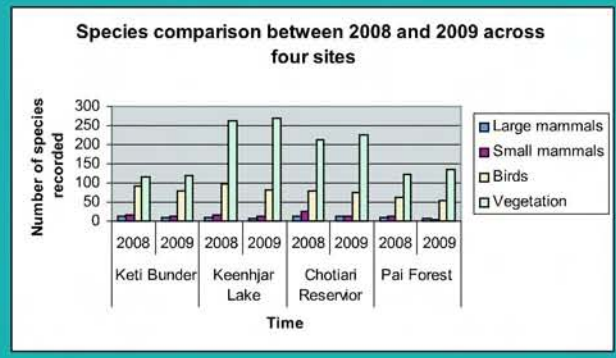
To assess the impact of the Programme at the four priority sites, periodic wildlife and habitat surveys are carried out. During the first quarter of 2009, the survey team visited established points across four sites to collect data on birds, mammals (small and large), reptiles and amphibians and vegetation. The results reveal that there are no major changes in the number of species recorded across the priority areas though there was some notable decline in migratory bird species, perhaps due to excessive hunting and ongoing degradation of wetlands habitat. However, the survey of vegetation showed that some species have yet to be recorded since a total of thirteen species not previously recorded from the sites were observed.

Programme's survey team during an ecological survey in Pai Forest

These plant species are: *Fumaria indica, Adiantum capillus-veneris, Celosia argentea, Indigofera caerulea, Leptochloa panacea, Melanocenchris abyssinica, Striga gesnerioides, Ottelia alismoides, Sarcostemma viminale, Sphenoclea zeylanica, Vallisneria spiralis, Euphorbia indica, Chara gracilis, Polyporus sp, Coprinus sp, Agricus sp, Coprinellus sp, Agrocybe, Avena fatua, Phalaris minor, Cistanche tubulosa.*

The table below shows the difference in species recorded between the detailed ecological baselines in 2007/2008 and the periodic wildlife and habitat surveys conducted in 2009.

These surveys will continue to be conducted in winter/spring and summer each year to assess the impact that community-based conservation is having on the local wildlife species of the priority sites.



Programme's survey team during an ecological survey at Keti Bunder

Conducting Collaborative Research

The Indus for All Programme has collaborated with the Pakistan Field Research Programme, a joint initiative of Government College, Lahore and universities in the United Kingdom to facilitate students to carry out field research in Pakistan in the field of conservation. This year, Emily Woodhouse from Imperial College, London, came to Keti Bunder for eight weeks to conduct pre-doctoral research. Her research project used the theoretical framework of the resilience theory to develop a comprehensive analysis of this ecological system and reflect on the roles that institutions can play in supporting climatic adaptive change. Coastal areas around the world are particularly vulnerable to climate change and there is a significant lack of research on this subject in Pakistan. Therefore her research project offers a good opportunity to present a perspective from Pakistan, thereby contributing to climate change discourses as well as shaping future natural resource management and development in Keti Bunder.

Emily Woodhouse interviewing local community members at Keti Bunder

The study draws upon a range of ecological and socio-economic data collected by WWF - Pakistan, along with other secondary sources. The data collected through the field work will complement the previously collected quantitative data, by focusing on qualitative research methods to gain deeper insight into community attitudes, experiences and values. The output of this study will be a research paper published in an international academic journal, a set of recommendations and a short report on future research possibilities at Keti Bunder, in order to feed into the Indus for All Programme's Action Plan.

Mr. Hasnain, (first from left) visiting Chotiari Reservoir along with the ecological assessment survey team

From November 2008 to April 2009, Muhammad Husnain from the Department of Landscape Planning & Environmental Impact Assessment, Technical University of Berlin, Germany worked on his PhD thesis with the support of the Indus for All Programme. His topic of research was 'Mitigation Banking and its application in Pakistan. Mitigation Banking is rapidly becoming a pre-emptive method for off-setting the negative impacts of development on the environment. Mitigation banking allows developers to buy 'credits' that represent the creation of a mechanism for maintaining natural habitats and their processes. Against these Credits, developers can then develop areas for commercial gain. In Germany and U.S.A mitigation banks are realistic solutions to the problems of developers building or developing land and then reneging on their obligations to safeguard the environment.

Mr. Husnain spent four months studying the possibilities of introducing mitigation banking in Pakistan. He tested the application of this concept, at Chotiari reservoir, one of the Programme's priority sites. He studied the impact of the construction of the reservoir. The initial results of his study showed that the construction of the reservoir was a classic case where mitigation banking could have been applied. His research demonstrated that the habitat loss due to the reservoir construction and subsequent water-logging, both in terms of wildlife habitat and agriculture, nearly matches the amount of agricultural land that receives water downstream of the reservoir.

His recommendation was that the Sindh Irrigation and Drainage Authority (SIDA) and Water and Power Development Authority (WAPDA) should have established a compensation bank for the affected land owners and charged a fee from the beneficiaries of the reservoir *i.e.* land owners and farmers living downstream. He stated that as little as Rs. 100/acre/annum could be collected to rehabilitate the surrounding area or compensate farmers affected by water-logged land. If this system had been set as part of the development of the reservoir, many issues that communities are facing today in terms of water-logging and loss of biodiversity could have been avoided.

Endorsement of Livelihood Plans

While considering the importance of linkages between poverty and the environment, the Indus for All Programme has prepared Livelihood Development Plans for each site through extensive consultation with the communities. The rationale behind these plans is to develop a sound livelihood base of the communities to reduce poverty in order for the judicious use of natural resources for bio-diversity conservation and sustainable use. The plans have identified interventions for improvement and diversification of community livelihoods by building their capacities and skills; value addition to the natural resources products and enhancing productivity of natural resources. The plans, therefore, aim to improve the economic status of the beneficiary communities, either through improving the management of their existing livelihoods or providing alternatives.

In this regard, plans were endorsed by a diverse set of the stakeholders in four consultative workshops held at three district head quarters. The representatives of District Government, civil society organizations and media gave their input and suggestions on the plans.

Consultative workshop held to endorse the Livelihood Development Plan for Pai Forest,

Spreading Awareness about Conservation

A 'Communication and Awareness Strategy has been devised and it is available on the Programme's website. Four quarterly issues of the Programme's newsletter, 'Indus Forever', have been developed and circulated. The circulation list includes government agencies, academia, NGOs, CBOs and other civil society organizations. The newsletter is also available on the website and gives updates on the Programme's key initiatives and outstanding achievements. The Programme staff has also developed posters, brochures and promotional material including stickers, calendars and shoulder bags and mugs for raising awareness about conservation issues in each of the four sites. Fact sheets on fisheries, nature clubs, world environment day and wildlife of Sindh were developed and disseminated to the general public during the celebrations of events and to schools in the four sites. A pocket size guide on the birds of the Indus Ecoregion and a booklet on wildlife of Sindh was also published.

From its inception in 2006, the Programme has continued a meaningful collaboration with the media, both collectively and individually and at various levels. As a result of the constant efforts of engaging the media, through journalists' trips to different important ecosystems, consultative workshops, formal and informal meetings and media releases, the Programme has successfully highlighted the issues related to the Indus Ecoregion. Environmental and conservation issues of the Indus Ecoregion including the deltaic areas are the heart of the Indus Journalists Forum: a forum for environmental journalism in the region.

This continual collaboration with the media resulting in news broadcasts, documentaries, talk shows, articles and reports on the environment and nature conservation has influenced decision-makers and policy makers significantly. The various articles, news reports, documentaries and talk shows have also helped a great deal in highlighting the Programme objectives. To date, the Programme has succeeded in receiving approximately getting around 400 minutes of air time on different English, Urdu and Sindhi TV channels through a diverse set of programmes. Programme staff has participated in talk shows and news reports even as different programmatic activities have been highlighted in news bulletins etc. The coverage in the print media has also been significant with prominent English, Urdu and Sindhi dailies as well as magazines covering the Programme's activities and highlighting environmental issues of the ecoregion.

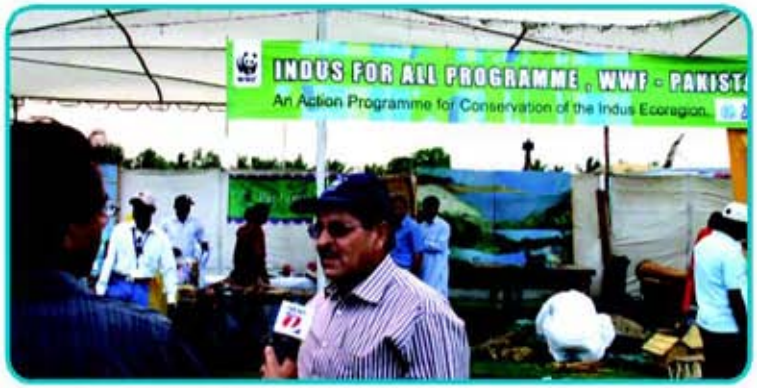
A total of 1121 news items (articles, news, letters to editors, columns etc) have appeared in leading English dailies such as Dawn, The News, The Nation, the Daily Times, Business Recorder, The Post and the Urdu daily Jang. Of these articles, 207 focused on water issues, 291 on biodiversity, 529 on environment, 94 on forestry issues, 160 on the Indus Ecoregion and 86 on the Indus for All Programme. The analysis of media coverage has revealed that the reduction in the flow of freshwater from the Indus River into the delta has been a priority concern. In addition, issues such as degradation of the mangrove ecosystem and agricultural land, poor management of coastal areas, loss of riverine forests, wetlands pollution and illegal hunting have been covered on a regular basis.

The efforts by the Indus for All Programme, WWF - P and media agencies have yielded encouraging outcomes in the form of raised awareness amongst the general public and policy responses concerning critical environmental issues. Some of the impacts that can be attributed to media outreach are:

1. Act of Parliament (legislation) for the protection of the mangrove ecosystem in the Indus Delta.
2. The Sindh Assembly carried out legislation for the first time for the protection of wildlife. According to this legislation , illegal hunting , punishments will be increased to include imprisonment up to 2 years (minimum 2 months and maximum 2 years) depending on species with a fine of Rs. 100,000-200,000.
3. Increasing frequency of the visits by members of the National Assembly's Standing Committee on Environment's Sub-committee on mangroves.

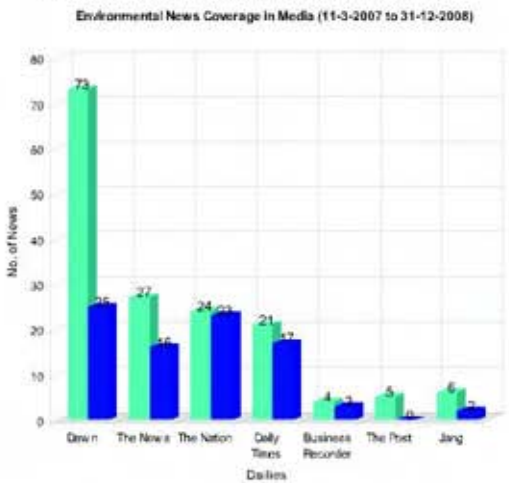
Due to the well-publicized call for afforestation and environmental conservation the current year, 2009, has been declared as the 'National Year of Environment' by the Government of Pakistan.

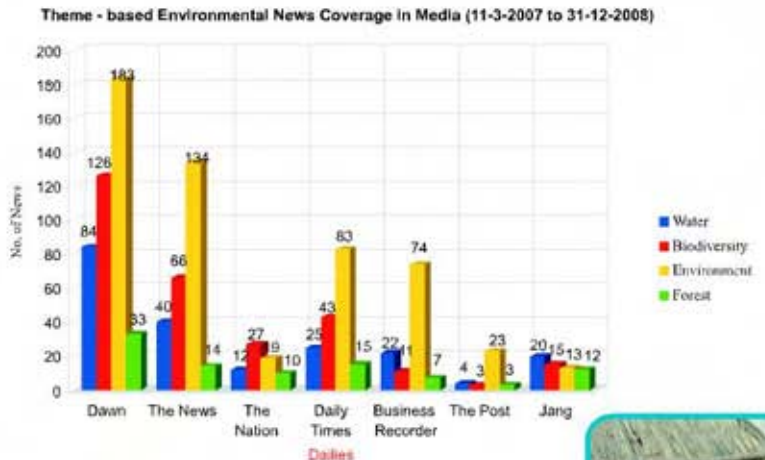
The Indus for All Programme has also produced a documentary titled "Flowing Indus Forever". The documentary will be screened at various events in order to sensitize the stakeholders. It will also be shown on TV for a wider audience.



Dr. Ghulam Akbar, being interviewed by a TV Reporter during Nature Carnival in Karachi


Journalist during a Press trip to Chotiari Reservoir



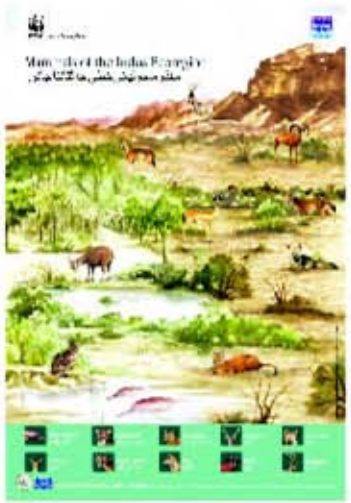


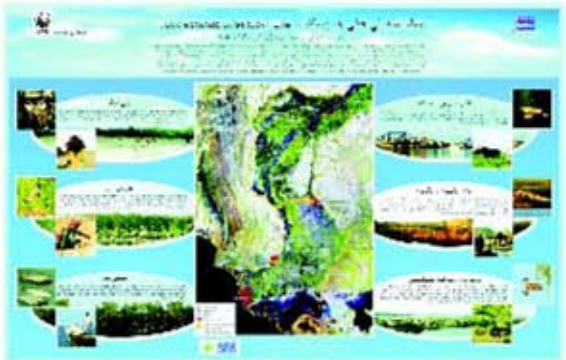
The Programme's website www.foreverindus.org has also been a frequently used portal, which indicates a good sharing of knowledge about the Indus Ecoregion and the Indus for All Programme.

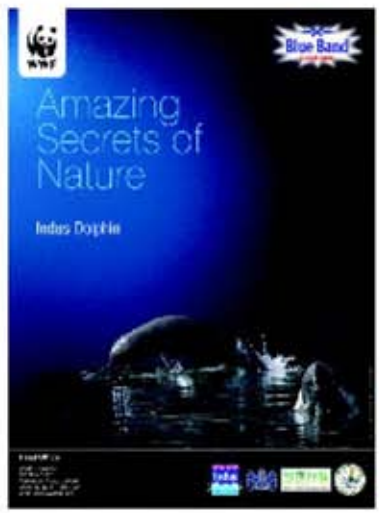

A Dawn TV Reporter interviewing a local woman at Keti Bunder during the Journalists' exposure visit

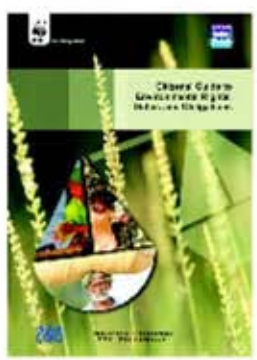
Indus for All Programme's

P u b l i c a t i o n s (July 2008 - June 2009)









Promoting Indus Ecoregion in the Urban Centres

Nature Carnival 2009

Indus for All Programme's stall at the Indus Carnival-09, Karachi

Thousands of people including schoolchildren, thronged to the Indus Carnival-2009, organized by WWF - P under the auspices of the Indus for All Programme at PAF Museum, Shahra-e-Faisal, on 15 February 2009. The carnival proved to be an informative and entertaining event to educate the masses, especially school going children about the Indus Ecoregion and other related concerns. A large number of schools took part in the carnival by preparing 3-D models on five selected themes including: animals and plants of the Indus ecoregion; the River Indus; the Indus Delta; importance of green living and the effects of climate change on human life.

Dignitaries attending the carnival included the deputy Speaker Sindh Assembly, Member of the National Assembly and, Conservator Wildlife, Sindh. While speaking on the occasion the honorable guests appreciated the students for their efforts in understanding and portraying various environmental concepts. They also praised WWF - Pakistan and other supporting agencies for organizing such an impressive and healthy learning event. Shields and prizes were awarded to the winners and runners- up at the end of the day.

Ms. Shehla Raza, Deputy Speaker Sindh Assembly and Ms. Fouzia Wahab, Member National Assembly attend Indus Carnival - 09, Karachi

A view of the crowd during concluding ceremony of the Indus Carnival-09

Spellathon-2009

SPELLATHON is an other aspect of public awareness-raising organized by WWF - P. The event focused on environmental awareness among school children. Started in 1996 the Spellathon has reached millions of school children and their parents in major cities of the country. In addition to increasing the knowledge of ecoregion

Awareness materials developed during Spellathon-09

environmental issues among school children and their parents it is equally helpful in promoting different conservation projects and programmes currently being implemented by WWF - P, its partners and stakeholders.

The Indus for All Programme became a part of the Spellathon-2009 by addressing more than 23,000 private school children in eight major cities of the country including five in the Indus Ecoregion (Karachi, Hyderabad, Shaheed Benazirabad (Nawabshah), Sanghar and Thatta). These cities represent major urban centres as well as priority sites. The campaign consisted of three steps: development of various levels of resource material; spelling test or evaluation and prize distribution. The resource material and prizes effectively covered various themes of the Indus Ecoregion such as the Indus Ecoregion Programme, flora and fauna of the Indus Ecoregion and effects of climate change among others.

The activity was successful in two different ways. It raised awareness about the ecoregion and its associated natural resources amongst a large number of school children and their families. It also amplified the visibility of the Indus for All Programme, its partners and stakeholders vis-à-vis a long-term vision to conserve biological diversity in the lower Indus Basin.

Friends of Indus Forum

The Indus for All Programme has established an advocacy platform called 'Friends of Indus Forum'. This forum acts as a policy watch-dog and brings together conservation activists, intellectuals and passionate individuals who want to collectively protect natural heritage of the Indus Ecoregion. The aim of the forum is to address the diverse threats to ecosystems whereby the survival of species is becoming increasingly difficult and in which people dependant on natural resources are being pushed into poverty and despair. The forum agrees that the vicious cycle of poverty and destruction of natural resources has been exacerbated in recent years and that this trend needs to be halted and ultimately reversed to preserve the ecological richness of Sindh.

This is an entirely voluntary forum, based on the interests of the individual members. The 'Friends of Indus' forum has a web-based link to promote online interaction and healthy debate. A portal has been developed on the Indus for All Programme's website (www.foreverindus.org). The online forum provides a good platform to all those who are interested in these issues and are eligible to become members of the forum. They can register themselves as **'Friends of Indus** and interact with other like-minded people on the issues pertaining to the Indus Ecoregion.

The forum meets regularly and hopes to serve as an advisory body for the Government of Sindh. The fourth meeting of the 'Friends of Indus' was held in Keti Bunder so that the participants could witness the degradation in the Indus Delta. It was decided that the forum would be registered under the Societies Act. Moreover, the forum decided to prepare a position paper on water requirements downstream of Kotri Barrage and meet with the Standing Committee of the National Assembly on Environment and sensitize them. The first body of office bearers was nominated as follows:

Mr. Naseer Memon (President)
Mr. Zahid Keerio (Vice President)
Mr. Nasir Ali Panhwar (General Secretary)
Ms. Zahida Detho (Joint Secretary)
Mr. Zulfiqar Halepoto (Information Secretary)
Mr. Ali Muhammad Sheikh (Treasurer)
Mr. Majeed Thahim (Office Secretary)

Friends of Indus Forum visit Pai Forest

The letterhead, logo and receipt book for the forum have been printed, while a listserv has been created for effective communication. The forum has developed and is currently implementing a work plan. An introductory presentation on the forum was also made at Shah Abdul Latif University in Khairpur to build linkages with the academia. Another such presentation was made to the Hyderabad Chamber of Commerce & Industries to sensitize the business community about the situation of the Indus River and the delta.

The membership of the forum has continued to increase during 2009. The current membership of the forum has reached 26. Members include Pakistan's permanent representative at the United Nations. H.H. Mr. Hussain Haroon and eminent archeologist Dr. Louis Flam.

The meetings of the forum were held as follows:

Date	Venue
July 29, 2008	Hyderabad
November 4, 2008	Karachi
December 23, 2008	Keti Bunder (Indus Delta)
March 16, 2009	Karachi
April 4, 2009	Hyderabad and Pai Forest

Mr. Hussain Haroon joining Friends of Indus Forum

Engaging Parliamentarians

On a recent visit to the Indus for All Programme's site office in Keti Bunder, the convener of the Sub-committee on mangroves for the National Assembly's Standing Committee on the Environment, Ms. Marvi Memon said that the Indus Delta is a significant eco-system and 10 MAF of water must be released below the Kotri Barrage to curb sea intrusion in the delta. Another member of the sub committee, MNA Tayab Hussain, was also present on the occasion. Ms. Memon said that fast depleting mangrove forests would further contribute to the degradation of this fragile ecosystem. She went on to add that illegal fishing nets should be banned as poor fishermen are being deprived of their only source of livelihood. She announced Rs. 5 million from her MNA fund for development schemes in Keti Bunder and Manchar Lake. She confirmed that a statement issued in 1992 by the Sindh Revenue Department, that the sea has invaded more than 1.2 million acres of fertile land in Thatta and adjoining areas. Ms. Memon stressed the need to take all efforts to avert the crisis and save the remaining delta.

The Programme's Coordinator, Nasir Ali Panhwar in his presentation highlighted the importance of the Indus Delta, as a Ramsar site. He described the delta as home to a variety of fish species, mangrove forests and more than two million people. He added that low water in the Indus river and sea intrusion had caused resource depletion, which has left fewer income opportunities for local people. He said that all the districts of Sindh in general and those of the coastal belt in particular should develop a proper land use plan supported by legislation. Development work under this plan should avoid the further depletion of precious resources. He suggested that rehabilitation Programme for the Indus Delta should be initiated through an independent body. The programme should focus on the revival of lost species, protection of the environment, resettlement of people and long term coastal management. He added that the Committee should recommend the release of 10 MAF of water downstream of the Kotri Barrage immediately, while demanding the initiation of a programme covering the provision of social and civic services in addition to disaster preparedness.

Ms. Marvi Memon, MNA planting a tree at the Keti Bunder site office

The site manager of the site office in Keti Bunder, Zahid Jalbani described the different initiatives being undertaken by the Programme including socio-economic assessments, and development of livelihood and natural resource management plans. He said that a vocational centre for women had been established in Keti Bunder, and wind and solar energy units were also provided. Extensive mangrove rehabilitation had also been undertaken. Earlier in the day, Committee Members visited the village of Tippan in Hajamaro creek, where they observed the degradation of the delta. They also visited various projects such as mangrove plantation, solar and wind energy systems, women's vocational centre and met the community

Ms. Memon, along with Programme Staff visit a creek village in Keti Bunder

members to gain an insight into the problems facing them. Representatives from Ministry of Environment, the Sindh Forest Department and Sindh's Environment Protection Agency (EPA) also accompanied the Committee members.

Partnership with the Government

The Indus for All Programme is working closely with the government of Sindh and has conducted a number of training workshops for government officials in all the four sites. These trainings have focused on planning, implementing and monitoring natural resource management programmes. The Programme has provided technical assistance to the Sindh Planning and Development Department and the Programme's GIS expert has played a key role in establishing the Sindh Forest Department's GIS Lab in Hyderabad.

With the help of government departments like Fisheries and Forest, the Programme also wants to establish two Conservation and Information Centres at Keenjhar Lake and Chotiari Reservoir. The objective is to provide information, create awareness about nature conservation and promote conservation activities among local communities. These centres will also promote alternate livelihood sources for local communities and will help the CBOs to engage in activities such as eco-tourism, organizing nature camps and adventure touring for schools and promoting local crafts.

The 5th meeting of the Sub-Committee of IESC, chaired by Secretary Forests and Wildlife, Govt. of Sindh

Corporate Partnerships

In its second year of implementation the Indus for All Programme has adopted a strong strategy of engaging with corporate partners. The Programme has a well-developed fifty year vision for the Indus Ecoregion. The scope of work that is currently underway and that will be undertaken in the future coupled with the complex problems facing programmatic interventions signifies that the Programme cannot go the distance alone. Therefore, building partnerships with not only beneficiary communities, government departments, and civil society organizations but also with corporations is essential. Consequently the Programme has initiated a series of partnerships with private sector enterprises such as Kifayat Publishers, Akzo Nobel Corporate (formerly ICI), AES Corporation, Hong Kong and Shanghai Banking Corporation (HSBC), and Qarshi Industries among others.

These partnerships are geared towards strengthening and extending a number of the Programme's existing outputs. For example, through the partnership with Kifayat Publishers educational tools and popular reading materials to highlight conservation and environmental issues of the Indus Ecoregion are being developed. Corporate partners such as AES, HSBC and Pakistan Council for Renewable Energy Technologies (PCRET) are key actors in providing alternative sources of energy to communities. These sources of energy include:15 bio-gas units and 16 solar energy units.

This is the first time the Programme is experimenting with hybrid energy units that have an advantage over single system technologies because they can supply electricity throughout the year. The Indus for All Programme has also signed a Memorandum of Understanding (MoU) with Qarshi Industries for the establishment of bio-fuel nurseries (10 acres) growing Jatropha and Castor oil at Keti Bunder and Keenjhar Lake. The provision of electricity and fuel to communities that have no hope of accessing either is not only a sign of the Programme's commitment but also signals an improvement in the community lifestyle, a reduction in expenditure on fuel such as Kerosene and a decline in the reliance on natural resources.

Signing a Memorandum of Understanding with HSBC

Signing a Memorandum of Understanding with Qarshi Industries

Partnership Fund

The Indus for All Programme's small grants facility, 'Partnership Fund,' calls for proposals in 2008-2009 were very successful. A total of 60 grant applications were received in first round and 119 applications were received in second round. The Fund intends to maintain this interest by working closely with site partners on proposal development and by publicizing innovative projects that have been made possible by its grant-making. During 2008-2009, the Partnership Fund's secretariat organized four workshops introducing stakeholders to the Fund's policies and guidelines; two of these workshops were held for local allies and partners from academia. As a result of the secretariat's hard work, the standard of projects accepted by the Partnership Fund's proposal review committee and technical review committee remains high. Of the 179 proposals submitted under both calls, only thirty were approved for funding. These thirty projects are being implemented in different parts of the Indus Ecoregion including four in the upper Indus Basin. Thematically these projects range from conservation of species and habitat to alternate livelihoods and introduction of alternate energy. NGOs and CBOs have been granted 66% of the total grant amount, government departments 28%, while academic institutions have been approved for 6%.

Projects Approved in 1st Round of Funding

No.	Project Title and Target Area	Project Implementer
1	Distribution, status and management of Smooth coated otter (*Lutrogale perspicillata*) in Indus Eco-region. Nara Khairpur	Sindh Wildlife Department, Sukkur
2	Assess the status of *Tenulosa illisha* (Palla) and the causes responsible for its decline in its natural habitat. Kotri – Sujawal (Indus River)	Fisheries Department Govt. of Sindh
3	Promote Alternate Energy for Sustainable Conservation of Indus Delta Ecoregion. Kharo Chhan Thatta	Action for Humanitarian Development
4	Alternative Energy Project- Dadu. (10 Villages of Dadu)	Young Samaji Tanzeem Johi, Dadu
5	Forest Protection Project through Forest Protection Committees. Matiari Forest	Indus Development Organization, Hyderabad
6	Rehabilitation of Booharki Forest. Booharki Forest, Badin	Badin Development & Research organization
7	Development and promotion of Biogas Technologies for meeting domestic fuel needs of rural areas and production of Bio Fertilizer. Villages of Pai Forests	Shah Lateef Welfare Association, Sakrand, Shaheed Benazirabad
8	Community Based Natural Resource Management Project. Kharo Chhan Thatta	Participatory Development Initiatives, Karachi
9	Creating Sustainable Environment through Promotion of Awareness & Energy Efficient Technologies. Villages of Keenjhar Lake, Thatta	Global Welfare and Development Organization, Thatta
10	Creating Sustainable Environment through Promotion of Awareness & Energy Efficient Technologies. Keenjhar Lake. Thatta	Keenjhar Fishermen Welfare Society, Thatta
11	Livelihood support to vulnerable communities, Jubhoo Lagoon. Jubhoo Lagoodn, Jati, Thtta	Sindh Rural Support Programme
12	Effect of water quality on the availability, size and growth of Indian major Carp 'Labeo rohit' in selected natural waters for sustainable fisheries in Punjab. (Selected Fishing grounds)	University of Veterinary & Animal Sciences, Lahore
13	Bioavailability and characterization of heavy metals in Mangroves ecosystem. Coastal areas of Karachi	PCSIR (Dr. Sarwat Ismail)
14	Conservation of Ladakh urial and associated wildlife in Shigar Valley, Skardu, Northern Areas. Shigar Valley, Skardu	Conservation Manager, WWF – Northern Areas

Projects Approved in 2nd Round of Funding

No.	Project Title	Project Implementer
1	Distribution and status of threatened species of fresh water turtles in selected Areas of Indus River System. River Indus	Zoological Survey Department, Govt. of Pakistan
2	Improvement and Rehabilitation of Haleji Lake. Haleji Lake, Thatta	Sindh Wildlife Department , Govt. of Sindh
3	Upper Indus watershed management through sea buckthorn plantation and livelihood improvement, Baltistan. Kothung-Lamsa sub-valley of Shigar, Skardu	Northern Areas Forest & Wildlife Department, Gilgit-Skardu
4	Development of Database of Marine and Freshwater Fish in Indus Eco-region and Adjacent Aquatic Environment. Throughout Pakistan including coastal and offshore water	Marine Fisheries Department Govt. of Pakistan
5	Sustainable Reuse of Drainage Effluent in Irrigated Agriculture for increasing crop productivity. Bareji Distributary Command Area Mirpur Khas	Institute of Irrigation & Drainage Engineering, Mehran University of Engineering & Technology, Jamshoro
6	Sustainable Management of two threatened Indus Delta Dolphin Species, the Indo-Pacific humpback (*Sousa chinensis*) and Indo-Pacific bottlenose (*Tursiops aduncus*). Indus Delta and Adjacent Costal Areas of Karachi & Thatta	Marine Conservation International (MCI)
7	Construction of Wetland at Village Majeed Keerio, Shaheed Benazairabad	Sindh ica Reforms Society, Shaheed Benazairabad
8	Integrated Agriculture Farming for Improving water Management, Enhancing Productivity and Alleviating Rural Poverty. UC Jhirk & Tando Hafiz Shah, Thatta	Research and Development Foundation (RedFound), Hyderabad
9	Use of Geographic Information System (GIS) to analyze marine turtle habitats: Sandspit / Hawksbay Eco-system. Sandpit/Hawksbay Beach Karachi	SHEHRI- Citizens for a Better Environment
10	Support for academia for dissemination of Scientific information and research. Indus Ecoregion	Conservation Division and WWF Sindh Programme WWF-P
11	Promotion Of Energy And Crab farming as alternative livlihood support to fishing community of Coastal area at Jati Coastal Area, Thatta	Mehran Social and Welfare and Development Organization, Thatta
12	Harnessing the Hunting Communities for protection of partridge, at Keenjhar Lake. Thatta	Keemjhar Maroo-Ara Welfare and Development Org. Thatta
13	Environmental Related Livlihood Support and alternative energy resource to reduce the wood cutting. Meyani Forest, Hyderabad	Mehran Research and Developent Society, Hyderabad
14	Support to Sindh Coastal Area Network For the National Level Events. Coastal Areas, Badin, Thatta and Karachi.	Badin Rural Development Society, Badin

Plantation under project 'Rehabilitation of Booharki Forest Badin'

Participants at the Partnership Fund's launching ceremony

Sindh's Legendary Riverine Forests

Sindh was once famous for its riverine forests. These types of forests, once found in abundance along the 'kacha' Indus River banks, are disappearing rapidly. There are several reasons for this such as over exploitation, decline of water in the river, grazing pressures, encroachments and misguided forest policies. Under the current forest lease policy, influential persons are illegally seizing forest land for the cultivation of crops. Sindh's riverine forests are also infamous as hiding places for dacoits. In recent years, given the breakdown in law and order, even forest personnel find it unsafe to move around and perform their duties freely! Without forest guards to protect the wooded lands, logging and theft have become uncontrollable. This is a disappointing state of affairs and one that has far reaching economic ramifications . During the era of British colonial rule these forest lands generated considerable revenue for the forest department.

However, conservation groups are taking some steps to improve the situation. For instance in the Matiari forest, near Hyderabad, even the local dacoits have been encouraged to become conservationists! In 2006, UNDP's Global Environmental Facility's Small Grants Programme gave funding to the Indus Development Organization, a local NGO. These funds were used by the Indus Development Organization to organize and mobilize the communities living in and around the forest to plant 10,000 trees and save what was left of this formerly dense riverine forest. The Matiari forest was originally spread over 28,000 acres, however now only a few thousand acres remain forested.

The Indus for All Programme is continuing the reforestation drive by giving NGOs more funds under its Partnership Fund to plant trees on another 1000 acres of forest department land.

The plantation has been done by the local villagers, who have formed community based organizations in the area (in 54 villages). The trees planted under the UNDP's GEF funding are being carefully tended. The predominant species found in riverine forests are Babul, Kandi, Bahan and Lai. These are all fast growing species, dependent on water received during the monsoon season.

"It is a struggle to save this forest" pointed out Zain Daudpota, who heads the project. "There have been attempts to put the forest on fire in order to lease the land. Once, they burnt down 20,000 trees in one night. Then there are all these encroachments they have grabbed land more than 10 feet inside the forest. The forest policy introduced in 2004 also allows people to get the land on lease but according to the policy you are supposed to plant trees first, before cutting them. But people who got the land are not planting any trees, they are just cutting them instead!".

The communities mobilized by the NGO have set up 2 protection committees for the Khebrani and Rais Mureed forests. These committees include members of CBOs and forest officers. The NGO is also teaching communities about bee keeping for honey, buffalo and goat rearing. "Almost 1 lakh cattle graze in the forest. There should also be sustainable cutting allowed. We want the people to benefit from the forest" said by Zain, who once used to be a journalist. The new thinking in conservation, which is participatory forest management, includes public involvement and partnerships. The NGO will also introduce communities to silkworm raising in the future.

"Our main concern right now, however, is to make this area lease-free. The forest lease policy is the most damaging. We want to lobby the local MPAs, MNAs and bring this to their notice. The forest department and community should work together to help this forest grow. The community has been mobilized and is very aware of the benefits of this forest. They are ready to own these forests" said Zain.

The forest is denser further on, in the island called 'Keti' which in the dry season is connected to the river bank. Species like Hog Deer and Wild boar are found in abundance in the island of 'Keti' . No one lives in the Keti area however, it is managed by a local family with extensive land holdings, the Jamotes, who protect the forest by allowing local people to graze their livestock there in exchange for community support in monitoring the forest and reporting any illegal logging.

The Keti area is an ideal spot for the promotion of eco-tourism. Here, in the cool shade of the forest, all you can hear are the sounds of birds and the gentle ripples of the river.

Bringing a Forest Back to Life

In April 1965, a dispute which started in the Rann of Kutch, located on the border of Sindh's Thar desert, led to the Indo-Pak War of 1965, when fighting broke out between India and Pakistan. Booharki Forest near Badin was in fact planted in 1965 in order to shore up the defenses of this border area. Seeds of the 'Devi' tree were sprayed from a plane. The Devi tree is an invasive species of tree that grows rapidly. In those days other species of trees such as Keekar and other local varieties could be found in the forest. However, many of these have died.

During the cyclone that hit Badin in 1999, almost 80% of the trees in the forest were uprooted. This natural disaster was followed by the floods in 2003. The little forest that remains looks very dry and ready to catch fire!

“The water course that brought water to the forest had become dismantled from neglect. The first thing we did was to restore the water course” explained members of the Badin Development and Research Organization (BDRO) who have been working in the area since 2002. They have already received funding from the UNDP Small Grants Programme to control water pollution in Badin town. Now they have received funding from WWF’s Indus for All Programme to restore Booharki forest and develop the forest ecosystem for the benefit of the local communities.

The BDRO has already leveled 3 acres of empty land and developed it for plantation now that the water course has been rehabilitated. They used local labour to prepare the water course in exchange for dead trees (for fuel wood) and water. A tough bargain, but the NGO explains: “These are desert people; they are always traveling in search of water”.

They added: “we are coordinating with the government's line department and establishing a nursery for the provision of plants for the forest”. BDRO has a difficult job ahead of them, as they plan to plant trees on almost 100 acres of forest land and introduce a ban on timber logging with the help of the government. However, the question remains: how are they going to prevent the local communities from cutting the trees?

“We are organizing the locals into community organizations and including them in our project. We tell them that when the trees go, the water table will go down as well and their (small scale) agriculture will be affected. Also, after April, the hot winds start blowing here and the forest protects the villagers from all the dust that is blown in from the Thar Desert. They can benefit from the forest by bee farming and grazing their livestock”. The hope is that the community organizations will emerge as strong conservation and pressure groups in this area.

There is a 'Malah community living outside the forest that have stopped fishing and settled here almost 30 years ago. “There were plenty trees here once and honey and green grass for the livestock. Then after the cyclone and the floods in 2003, most of the trees got damaged. Also, there is hardly any water these days. Yes, once the water comes for the forest we can use it as well for our livestock” explained one villager. The villagers wait patiently for an improvement in their circumstances, but in the mean time, they have their buffaloes and sheep to feed and wheat grow with whatever scarce water they can extract from a tube-well.

The BDRO is hard at work acquire irrigation water for the forest. They have signed an agreement with the Forest Department, and will train staff. As the army is no longer interested in the forest, the local communities are getting ready to manage their own natural resources.

WWF 2008 Valuation Studies: Government Reception

A "valuation" refers to the assignment of monetary values to non-market goods and services. In 2008, WWF - Pakistan's Indus for All Programme completed a valuation of five ecosystems: coastal, freshwater, forest, agricultural and rangeland.

For valuation studies to be policy-relevant, they must be total economic value (TEV) studies, which combine estimates of direct consumptive use of the (DUV), its indirect use value (IUV), and its non-use value (NUV). The advantage of a TEV, a value expressed in billions of rupees, is that it can readily be represented as a Gross Domestic Product (GDP) figure, or, directly incorporated in a cost benefit analysis (CBA), say of large scale infrastructure projects.

The results of WWF's 2008 valuation study presented below must be interpreted with care by planners and policy makers:

Ecosystem Values (Present Value, Rs. Bn)

2008 September	DUV	IUV	NUV	TEV
Deltaic (Keti Bunder)	7.2	0.6	0.3	8
Rangeland (Chotiari)	2.0	-	2.0	4
Freshwater (Keenjhar)	2.9	5.5	0.3	9
Forest (Pai)	0.7	0.1	1.5	21
Agriculture (Pai)	18.3	-		
Total	30.9	6.1	4.0	41

Cautionary remarks include: (a) while the net present value (figures are annual, rather than adopting the often used 30 year time horizon, they represent an infinite time horizon that must be interpreted with the help of a sensitivity analysis and specific assumptions contained in the report (e.g. dividing the DUV figure at Keti Bunder by the number of fishers or households does not yield a per capita figure!); and, (b) before the figures above can be adopted as GDP figures, a distinction between asset values (stock) and flow values (income) for DUV, IUV and NUV estimates presented in the report must be examined carefully. The latter relate to GDP and may be presented as GDP figures.

The Government of Pakistan expressed great interest in the report, in particular the Planning Commission, who heard the detailed results a green accounting workshop in Islamabad on 28.5.09. The Additional Secretary, Planning and Development Division, Planning Commission noted at the event that valuation studies are an important planning tool. The Prime Minister has cited a 2006 World Bank study stating that the cost of environmental degradation in Pakistan was 6 per cent of the GDP.

Like the WWF 2008 study, the World Bank 2006 study "Pakistan Strategic Country Environmental Assessment," South Asia, Environment and Social Development Unit, Report No. 36946-PK also estimated TEVs and scaled results to the national level. The study examined two ecosystems (forests and rangelands) and four environmental quality indices, (water, urban air, airborne lead, indoor air) that impose health costs and impact productivity. Noting the overlap (forests and rangeland) and complementarity between WWF's study and the World Bank's study, Planning and Development Division officials requested further input and discussion in relation to WWF's 2008 study.

Valuation team in Keti Bunder © Ben Groom

Green Accounting: WWF's 2008 Working Paper and Workshop Series

"Green accounting" describes a statistical office's attempt to signal the "draw down" of natural capital stock within its annual measurement of economic growth (i.e., Net National Product or NNP). Typically, statisticians examine draw down (or "depreciation") of machines, buildings, inventories, or, roads (man-made capital). The corresponding information on depreciation of natural capital stock (renewable and non-renewable resources) would allow planners to set money aside to replenish natural capital stock in coming years, and not just man made capital!

A working group at the Green Accounting Consultative Workshop, Islamabad

In 2008 the Programme completed a technical working paper on the subject. It is annexed to the Programme's Total Economic Value (TEV) study of coastal, freshwater, forest, agricultural and rangeland ecosystems. Arguably, the very first step in the process of institutionalizing green accounting in Pakistan is to practically demonstrate how environmental asset values that will be placed into Systems of National Accounts (SNAs) can be measured in billions of rupees. This was accomplished by the Programme's 2008 TEV study.

The technical working paper annexed in this study takes care of another crucial first step, it demonstrates how to interpret and adapt the billion rupee estimates before they can be adopted as GDP figures. For example, it is suggested that assets that are already capitalized (e.g., working capital in fishing and agriculture) may be excluded; meanwhile, flow values (income) for DUV, IUV and NUV estimates presented in the report can be included in green accounting calculations.

In order to operationalise green accounting in Pakistan, stakeholder feedback and recommendations are needed on the foundational work described above. Accordingly, a series of three workshops was held on the subject of green accounting: Hyderabad (27.4.09), Karachi (13.5.09), and, Islamabad (28.5.09) where the event was jointly hosted with the Sustainable Development Policy Institute (SDPI). With this as an entry point, WWF - Pakistan plans to submit recommendations of stakeholders at district, provincial and federal levels to the Executive Committee of the National Economic Council, Ministry of Finance and Federal Board of Revenue for due consideration.

Workshop recommendations were generated by stakeholders, among others, from the Planning Commission, Federal Board of Revenue, State Bank of Pakistan, Ministry of Finance, Poverty Reduction Strategy Paper (PRSP) Secretariat, Ministry of Environment, Institute of Business Administration, University of Karachi's Applied Economics Research Centre, University of Sindh, Pakistan Institute of Development Economics, Chief Economists from the Planning and Development Division, Chief Economists from commercial banks (e.g., Citigroup), Gallup Pakistan, IUCN-Pakistan, Sungi, Executive District Officers, and numerous non-governmental organization grant recipients of the Programme's Partnership Fund.

Recommendations examined stages to cross before statisticians at the Planning and Development Division (P&DD) of the Planning Commission periodically generate green accounts. The final step is for P&DD statisticians to agree to equations, variables required for these, and to request the Statistical Division / Federal Bureau of Statistics to periodically compile the raw data series required for each such variable. Along the way, there is a need to select a model sub-sector for this purpose (e.g., marine fisheries under agricultural sector), training needs assessments carried out and capacity built, and slowly basing fiscal and monetary policy, for example, on green accounting information so as to know when to stimulate savings and slow consumption.

Bringing Keti Bunder back to life

A view of chann Creek in Keti Bunder

The Programme supports communities by improving their huts and providing clean drinking water

Bringing Keti Bunder Back to Life

The Indus Delta is the seventh largest in the world and consists of several creeks, including those located in Keti Bunder, a small fishing town in Thatta district. The area around Keti Bunder used to contain one of the largest tracts of arid zone mangrove forests (during the 1980's). This was an important habitat for migratory birds. Keti Bunder town itself was once a prosperous commercial center on the delta, a gateway to the Arabian Sea. Located approximately 200 km south-east from the city of Karachi, the town has had to change location thrice during the last century due to seawater intrusion. Over the years, because of the lack of freshwater in the Indus River below Kotri Barrage, the Indus Delta is dying.

Much of the dense mangrove forest cover in the delta area has been lost. The remaining mangrove forests of Keti Bunder are now categorized as 'Protected Forests' and the land, lakes and mud flats have been notified as a 'Wildlife Sanctuary' and as a Ramsar Site a wetland of international significance. Keti Bunder is located on the Indus Flyway, which is a globally recognized flyover for migratory birds from Siberia. The migratory birds include pelicans, egrets, herons and waders. A total of 69 species were recorded in the area during an ecological assessment conducted in 2006.

Among terrestrial mammals, Wild boar, Asiatic jackal, Fishing cat and Indian porcupine are common. Reptiles of the area include cobras, vipers and lizards. The marine mammals include Bottlenose dolphins, Hump-backed dolphins and Finless porpoises.

Sixty three fish species and 24 shell species were recorded in the Keti Bunder area. Fish and shrimp species have decreased in recent years. No one, it seems, can stop the relentless seawater from coming in and destroying the mangrove ecosystem which supports shrimp and other freshwater fish.

Keti Bunder town once used to be a hub of fishing activity but it is now a poverty stricken settlement spread over 35 acres and surrounded by seawater.

Keti Bunder Taluka stretches over 60,969 hectares and consists of 42 Dehs (settlements) of which 28 have been engulfed by the intruding sea. There are four major creeks in the Keti Bunder area: Chann, Hajamro, Turshan and Khobar. All four creeks which also comprise human settlements come within the purview of the Indus for All Programme's work.

The total population of the area is 28,000 and more than 90 per cent of the population is illiterate and lives well below the poverty line. The local communities rely heavily on natural resources such as fish and mangroves. Inland, they rely on subsistence farming and other marginal enterprises including poultry farming, beetle leaf farming and growing banana orchards.

In the creek areas, dense mangroves cover 2,631 hectares, medium mangroves cover roughly 1,996 hectares and sparse mangroves cover 3,588 hectares. The Chann creek is particularly vulnerable and is losing mangrove cover on a daily basis due to aggressive seawater intrusion and grazing of camels owned by the local populace.

The fishermen of the area now catch seawater fish and shrimp in the creeks. The fish catch is sold directly to Karachi. The fishermen complain that their catch is down to 70-80 per cent of what it was only a few years ago. Due to seawater intrusion, both underground and surface freshwater resources in the Keti Bunder have been degraded. In earlier years, locals would grow red rice, coconuts and melons but now much of their agricultural lands have either been swept away by the sea or devastated by water logging and salinity.

While eight species of mangroves were once reported to occur in the area, only three species have survived: *Avicennia marina*, *Aegiceras corniculata* and *Rhizophora mucronata*. The gradual decrease in freshwater and the increase in saline water have seriously constrained mangrove growth in the delta. The continued loss of freshwater in the delta due to poor water policies could spell the death of a critical 10 per cent of the mangrove forest that still survives.

Since mangroves are rich breeding grounds for fish and shrimp, the Indus for All Programme has been helping the local communities to plant mangrove saplings and regenerate the mangrove forests. Rehabilitation has started on 7,500 hectares of mud flats in the Keti Bunder area, and already one can see green saplings growing in areas that were barren. The women of the area actively participate in mangrove planting and help protect the young saplings. Most of the new plantation is of *Avicennia marina* since it requires little fresh water.

The CBOs have been sensitized about the importance of protecting the mangroves by controlling logging and camel grazing. Local festivals have been organized by the Programme in which theatre has been used to teach people the importance of protecting the mangroves. Even the religious leaders of the area have been mobilized to give sermons on nature conservation. The local community is currently involved in planting mangroves on mud flats near their homes.

To spread awareness about the ecological problems threatening the area, the Programme hopes to establish an information centre in Keti Bunder town. The Sindh Forest Department has agreed to hand over a two-room residence for the establishment of a Conservation and Information Centre. The Programme will be responsible for renovating this building.

Approximately 90 per cent of the population of Keti Bunder depends on fishing for their livelihood and is illiterate. Due to the decline in fish catch and the lack of freshwater for domestic consumption in the area, there has been substantial out-migration from Keti Bunder to Karachi and other areas in recent years. The Indus for All Programme has helped the local community to address their problems by forming Community-based Organizations (CBOs).

A total of nine CBOs have been formed with a membership of 611 on a self help basis. Five women's groups have been formed with a total membership of 52. The CBO members have been given trainings in basic management and taken on exposure visits to Sonmiani Bay, where there is dense community managed mangrove cover. A vocational centre for women has been established in Keti Bunder town, where sewing is taught. Local women have also been sensitized about health and hygiene through three workshops.

After completing a detailed socio-economic and ecological assessment of the area, the Indus for All Programme is now focusing on natural resource management and livelihood interventions. In a nursery located in the garden of their site office, project staff is experimenting with bio-fuels and growing vegetables for their own consumption. They hope to introduce the concept of kitchen gardening in the area very soon.

CBO members during mangroves plantation

Soon after the last cyclone hit the area on 25 June 2007 (Yemyin, No. 03B), several rehabilitation interventions were carried out by the Programme - they included: one boat water tanker given to community, four fixed potable water tanks installed in various locations, 30 thatched huts built for local communities and 20 fully damaged boats belonging to fishermen were repaired.

A CBO based in Keti Bunder town is now running the water tanker boat service which distributes 4,000 liters of water to each village in the area twice a month. The Programme has also helped install solar energy units and wind turbines which generate electricity (for light bulbs) in two villages where electricity is not available.

The Programme has also organized medical camps in the Keti Bunder area to provide free medical aid. They have also held livestock vaccination camps. Three nature clubs were formed to extend the Programme's outreach to local schools. The local CBOs also celebrate important environmental days such as World Environment Day to highlight conservation issues. A total of 57 religious leaders in the area have participated in consultative workshops and were engaged to disseminate the message of conservation through sermons. Recently, a large festival was organized on an environmental theme and over 2000 people living in the Keti Bunder area attended the festival and learnt about the importance of natural resources. The Programme has also held a resource users workshop and completed a traditional ecological knowledge survey to learn from the local people.

The Programme has realized in the past two years that coastal communities have a very active network which can be used to disseminate messages effectively. Team work is also vital whilst working in such remote areas. In this coastal belt, climate change is a very real phenomenon and is affecting communities directly. The Programme is working hard to protect the area from further calamities. They are doing this by promoting the existence of self-sustaining communities that can manage the mangrove forests and maintain fish stocks.

Solar energy

The Hajamro Mahol Dost Development and Welfare Organisation, a local CBO, has helped install solar panels in one school and one mosque in Hajamro Creek. These solar energy units, along with their battery cells, power two fans and one energy saver bulb. The solar panels were installed with the help of the Pakistan Council for Renewable Energy Technologies (PCRET). There are a total of five solar energy units in the area. The other units have been installed in mosques in various villages.

With PCRET's support the Programme has installed solar panels in schools and mosques in the creeks

Wind power

The Programme has installed five new wind turbines in Hajamro and Khobar Creeks where there is no electricity. Roughly 20 to 25 households can benefit from one wind turbine which generates 500 watts of electricity (enough for 20 energy saver light bulbs of 20 watts each). Now there is increased economic activity in the night such as grading shrimp, making mats and women can also complete their chores more easily. With the provision of electricity there is also greater opportunity for organizing social gatherings. The families are also saving on the cost of the expensive kerosene oil which they used before the installation of these energy units. The CBOs ensure the maintenance of the windmills, charging, each household, Rs. 50 per month as maintenance cost. Approximately 100 households have been provided with electricity through the wind turbines and other villagers now want the technology in their homes as well.

A wind turbine in a creek village

Boat tanker

A boat water tanker (with a capacity of 16,000 litres) has been delivered by the Programme and is operational. The Sahil Welfare and Development Organisation, a local CBO manages the tanker, which delivers water to creek villages twice a month. This is canal water that is brought into Keti Bunder town by large tankers. The water is first stored in a large tank in Keti Bunder town before it is transferred to the boat tanker and distributed among the various villages. Since the average consumption of a household of 7 members (cooking, drinking and bathing) is 80-96 liters which costs Rs 50-60 per day, the villagers save Rs. 0.38 per liter or Rs. 30 per day. This has also saved them expensive and time consuming (1 to 3 hours) trips to Keti Bunder for freshwater. The women control the distribution of the water in the villages, where it is delivered to fixed water tanks.

A boat water tanker arranged by the Programme provides clean drinking water to the villages of Hajamro creek

Homes for widows

After the cyclone hit the area in 2007, the Programme in collaboration with Aga Khan Planning and Building Services (AKPBS) decided to provide houses to widows and orphans living in four villages. The CBOs recommended the names of the families who should receive the houses. These raised houses with thatched roofs were especially designed by the project staff. Thirty houses were built. The local community appreciated the design so much that they are now copying it in the construction of new houses.

An improved hut in Hajamro Creek

Cold storage facility

The CBOs have pooled their savings to buy cold storage units. The members of the CBOs can use these to store their fish catch and decide when to take the catch into town to sell it. This allows them to save on travel costs and improve their income from fishing.

A cold storage tank provided by the Programme helps fishermen keep their catch fresh

Introducing bio-fuel crops

A Jatropha plant bearing fruit

Adjacent to the Indus for All Programme's site office, a nursery for the bio-fuel crops of Jatropha and Castor has been setup and a demonstration plot of one hectare has been established. These crops can grow easily in dry, arid conditions like those of Keti Bunder and the project staff hopes to introduce both Jatropha and Castor in the local agricultural economy, since they will become important when the demand for bio-fuel goes up in Pakistan. The spectre of climate change has become real and threatens the planet, which means most countries will be developing alternate fuels hence this is a timely project. Additionally, a significant area of degraded land will be brought back into production by these crops. The testing of these new crops, Jatropha and Castor, is proving to be quite successful.

A water storage tank built by the Programme near Keti Bunder Town

"The school changed our methods of farming..."

In a dusty field located near the Indus for All Programme's site office, a group of farmers have gathered on their demonstration plot. Vegetables have been grown on this plot using Integrated Pest Management practices. This is Keti Bunder's first Farmer Field School and 19 trainee farmers were registered in the school which ran from January to June 2009.

"We grew vegetables, with reduced pesticides and fertilizers," explains one of the farmers, Ahmed Samoo. "We used farmyard manure and lanterns which killed harmful insects. As a result, we only needed one spray of pesticide." Usually, the farmers spray their fields at least 6 times! At the end of the sessions, the farmers did a cost and benefit analysis which helped sensitize them to good practices. The Farmer Field School met once a week on Tuesdays, from 11-3 pm. A technical resource person from the District Agricultural Department visited the school once a month for technical input.

The four best farmers from among the trainees were selected to be trained as Master Trainers. They can now teach other farmers the application of tested tools such as better management practices and integrated pest management. "We got such good results from the vegetables we grew that it really changed our methods of farming. We are very satisfied with what we have learnt and will replicate it in our lands," said another farmer.

After the summer, the farmers plan to conduct another Farmer Field School and they will decide for themselves what to plant this time. The farmers all volunteer for these schools and the cost is borne by them. The idea for the Farmer Field School was not within the boundary of the Programme's work plan for the area. However project staff decided it was worthwhile, given all the small farmers in the area near their site office. The Farmer Field School turned out to be extremely successful in introducing better farming practices in the area.

Farmers learn best management practices in the field school

"We learnt how to manage the centre by ourselves..."

Keti Bunder is a ramshackle town with a few cement houses, located right next to a creek full of seawater. Just off the main road, is the local government primary school. In the evenings, from 3-6 pm, the school is used as a vocational centre by the local women where they learn embroidery and tailoring.

The Keti Women's Development and Welfare Organisation is running this vocational centre. Abida and Tabussam are two of the teachers, who are also master trainers in the vocational centre. "We need our own room badly but for now we are running the centre in the school," they explain. The centre has been operational since July 2008 and up to 22 young females have been provided training in embroidery and tailoring. Most of these women are now stitching clothes for friends and family. Some have started taking orders from the townspeople and they hope to be able to supply to stores in Karachi soon. Fifteen women are currently enrolled in the centre and are under training.

"At first we didn't know anything, but we learnt how to manage the centre ourselves. Most of us already knew how to stitch so that was not a problem. Now thanks to the machines provided by the project, we can stitch suits and charge for them. We charge between Rs 120-150 for one suit, and more for embroidered clothes which cost between Rs 1,000-4,000, since these take much more time to prepare," points out Abida.

The women say they have also become much more confident and the extra income from the clothes helps them become more empowered and independent. They are ready to market their products in the metropolis of Karachi and see lots of potential for their future business.

Local women prepare handicrafts in the vocational centre

A herd of Camels in Keti Bunder

Community care for

Keenjhar Lake

A make-shift hut, built near Keenjhar Lake by typha grass

Sport sailing can be promoted at Keenjhar

Other issues threatening the lake are the spread of alien invasive species like algae in the water and the increase in agriculture in the nearby catchment area. Influential people are buying land near the lake and starting large farms using the water they illegally siphon off from the lake. There is also illegal hunting and shooting of ducks in the winter season (the lake is a designated wildlife refuge). A few plant species, new to science have been discovered in the area, however, more scientific research is needed.

The involvement of the local people is crucial, which is why the Indus for All Programme has helped local communities organize themselves into small Community-based Organizations. Communities engage in four major occupations: fishing, quarrying, mat-making and to some extent, agriculture. Several villages have primary schools, but literacy rates are very low. The Programme is targeting 38 villages. Nine Community-based Organizations (CBOs) have been established so far. Out of these, five CBOs were formed on the western side of Keenjhar Lake where previously there were no community organizations.

In the past two years, CBOs have been sensitized on environmental issues threatening the lake and the local population's health and well-being. The CBOs have been given trainings on the sustainable use of natural resources. Nature Clubs have been formed and nature camps and tree plantation activities carried out. The Programme has developed the capacities of the CBOs and supported their networking.

Local youth are mobilising to keep the environs of Keenjhar clean

According to the site manager at Thatta, "We ask them, do you want to solve your own problems? We can help with the networking and the trainings. Our emphasis is on self-sufficiency. We tell them, this is your environment, your children, your future. How can you change it?" In the past two years, the project staff has slowly gained the trust and support of the local communities.

The Programme has also provided trainings to government officials in Natural Resource Management (NRM) planning, implementation and monitoring. Geographic Information System (GIS) based NRM planning has been conducted. Journalists from the print and electronic media have visited the lake on exposure visits. A vocational centre for girls was established in Jhimpir village and is being run on a voluntary basis. Twenty five girls have received training in stitching and sewing. The female CBOs have also started kitchen gardens in their areas and are conducting health and hygiene workshops.

A view of community consultation near Keenjhar Lake

Last year, medical camps and livestock vaccination camps were set up at Keenjhar Lake with the help of CBOs and relevant government departments. This year, the Programme organized a large 'Keenjhar Mela' festival with the help of local partners in which more than 1,000 members of the local community participated. The festival was a big success. After the Indus for All Programme started working in the area, people have started to realize that their social problems are rooted in the degradation of their natural resources. Marginal and silenced sections of society are now becoming vocal and CBOs are taking their own initiatives to protect the lake and its wildlife.

Malakhro, a traditional Sindhi wrestling at local festival

Local communities try to promote traditional fishing practices to avoid over exploitation of fisheries

Stopping Poisonous Fishing

Poison was often used to catch fish in hard to access ditches and deep ponds. The same practice was also carried out in the KB Feeder canal (upper) which supplies water to the lake. This was done by the contractors/fishermen. During the last closure of the canal from 25th Dec 2007 - 15th January 2008, the Jhole Maari Welfare and Development Organization (JMWDO), Chul site, patrolled the canal in order to prevent fishermen from poisoning the canal in their area. The efforts of the CBO were successful. The CBO took this initiative themselves and informed WWF - P after the action was successful. They maintain that this poisoned fish is eaten by humans; the poison also drifts into the lake thus polluting the lake and contaminating the water the villagers drink. The JMWDO is also advocating that the polluted stagnant water in the canal (due to the annual closure) should by-pass the lake once the canal is opened.

Enforcing No Hunting Zones

The villages around Keenjhar have designated various no hunting zones. On 23rd March 2008, 50-60 people with 15-20 dogs from Rajanpur were stopped from hunting near the lake. The hunters were told that if they had written permission from the concerned department then they would be allowed to continue otherwise the community maintained the area as a no hunting zone. The hunting party was also apprised of the dwindling wildlife conditions around the lake due to unabated hunting in the past. However, the hunters were told they are welcome to visit the area to enjoy its scenery. Given their diplomatic handling of the incident, the party which used to come on annual hunting trips to the area, promised not to come again for the purpose of hunting. This was again done through the efforts of the JMWDO.

Grey partridges have increased considerably after the community declared the area a no hunting zone

Banning Washing of Vehicles in the Lake

Many visitors to Keenjhar Lake wash their vehicles in the lake and the diesel and petrol pollutes the lake water. The adjacent villagers use the same polluted water for drinking and washing. The Keenjhar Mahul Dost Welfare and Development Organization in Hilaya recently ran a protest campaign of their own to stop vehicle owners from washing their trucks in the lake. They even registered cases against some of the frequent polluters. They have also established a helpline at 'Picnic Point' near the main entrance of Keenjhar Lake in case someone is drowning and needs help.

Local communities have mobilised to reduce the harmful practices like washing vehicles in the lake

Celebrating Anti Drugs Day

The Jhole Maari Welfare and Development Organization in Chul celebrated anti drugs day this year and launched an organized campaign against drug dealing in their area. The District Police Officer (DPO) Thatta took notice of drug dealing in the area and ordered raids in this regard resulting in the halt of the drug business in the vicinity.

Tree Plantation by the Community

Many years ago, two rich forests existed along the eastern side of Keenjhar Lake: Hillaya and Sonda forests. Now only a fraction of Sonda forest remains and is struggling to survive as deforestation continues. The Keenjhar Marro-Ara Welfare and Development Organization has taken steps to green the Amirpir area. The community based organization (CBO) members donated two hectares in village Nabi Bux Palari for tree plantation. The saplings were provided by the project staff. These two hectares will serve as a model for sustainable energy plantation. This will reduce the pressure on the natural plantation for wood cutting as wood for domestic use becomes available. Green belts will also increase in villages around Keenjhar Lake which are useful for both the communities and the environment. The residents of village Nabi Bux Palari have also set up a farmer field school and are teaching local farmers the benefits of reducing the use of pesticides in their fields.

Community observes a plantation campaign near Keenjhar Lake

Conservation of Partridges

Three CBOs namely Keenjhar Marro-Ara Welfare and Development Organization (KMWDO), Jhole Maari Welfare and Development Organization and Keenjhar Youth Welfare and Development Organization have declared their area safe for the conservation of partridges. The main role in this campaign, however, is being played by KMWDO and the Syed family. KMWDO started to mobilize the villagers for the protection of game birds in Amirpir. Before their efforts, a majority of the people used game birds as a source of livelihood. Thanks to the untiring efforts of the CBO, the communities now accept the importance of conserving partridges. With the help of the local community, the CBO has also declared the Amirpir area as a protected area for partridges. On the basis of these efforts KMWDO is willing to introduce 'Eco-Tourism' thereby reducing poverty through alternative income generation activities. The CBO has resisted hunters in the area and reported them to the concerned departments and assisted the departments in taking action. Other partners CBOs are also interested in increasing their coordination with the Wildlife Department. The Indus for All Programme team in Thatta is negotiating with the Wildlife Department so that the community efforts can be strengthened.

Partridge chicks being hatched and reared at home before release

Health Support Initiatives

Participants at a health and hygiene workshop for local women

There are no health facilities in Chul (the inlet of the lake). Local communities are suffering from a variety of diseases and physical abnormalities. The death rate is high. The Jhole Maari Welfare and Development Organization (JMWDO) has taken a few small scale health initiatives for their community. The CBO contacted the health department in Karachi, who encouraged them to contact the Rotary Club project of Karachi. The Rotary Club is running a health care initiative in collaboration with the Social Welfare Department and Dow University which provides free prostheses (artificial limbs). The JMWDO have started contacting people who can benefit from this project. The CBO is very enthusiastic and wants to cater to many initiatives but their activities are limited by financial constraints. Currently they are seeking government and non government support in the form of medical camps, regular visits of Lady Health Workers and doctors. In this way the CBO is taking small steps towards improving the health of their local communities.

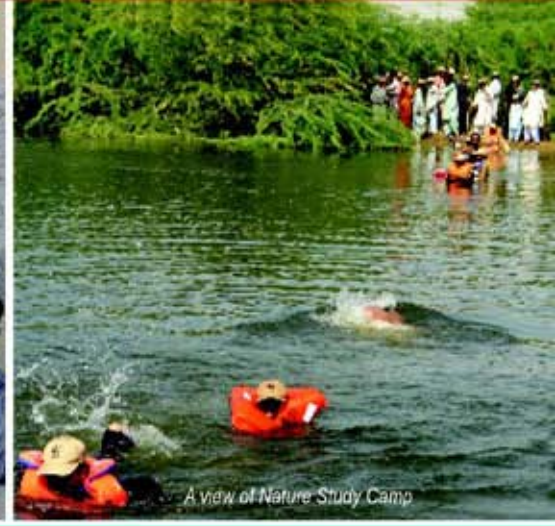
Contacting the Environment Protection Agency

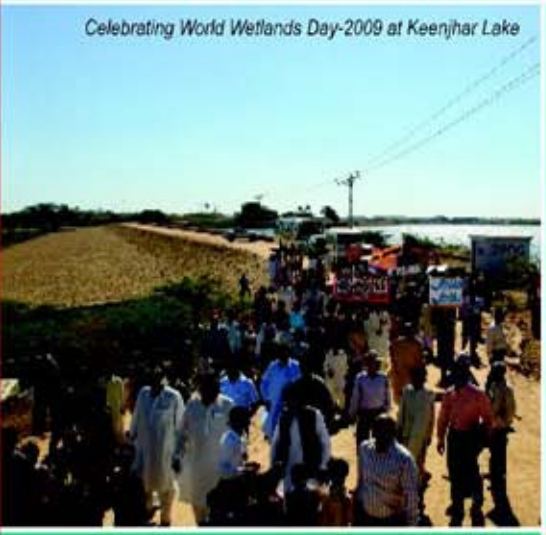
The Jhole Maari Welfare and Development Organization (JMWDO) presented the issue of industrial effluents from Nooriabad affecting the water quality of Keenjhar Lake through the canals and hill torrents to the Environment Protection Agency (EPA). The EPA agreed in principle to take up this issue seriously because it is one of the primary causes of environmental and water pollution in Keenjhar Lake. The EPA recently contacted the JMWDO to prepare a case and formally present it to the agency.

Voluntary Vocational Centre

A women's community based organization (CBO) called Roshni Keenjhar Welfare and Development Organisation (RKWDO) has been working for social and environmental awareness and the sustainable use of natural resources in Jhimpir for more than a year now. Jhimpir is a remote town where people are not much inclined towards women's development. The community women decided to organize themselves and formed their own CBO. After the formation of the CBO, members realized that in Jhimpir the majority of women have indigenous skills but they cannot market these skills and have no access to the market. The CBO assumed the responsibility of voluntarily running the vocational centre at Jhimpir town with the support of all their members. The Programme donated sewing machines and other equipment. The President of the CBO, Ms. Umi Kalsoom, donated one room for the vocational centre free of cost. The CBO has also started kitchen gardening in Jhimpir town. The project staff provides the seeds for the plants.

Teachers Training in Environmental Education


A view of Nature Study Camp

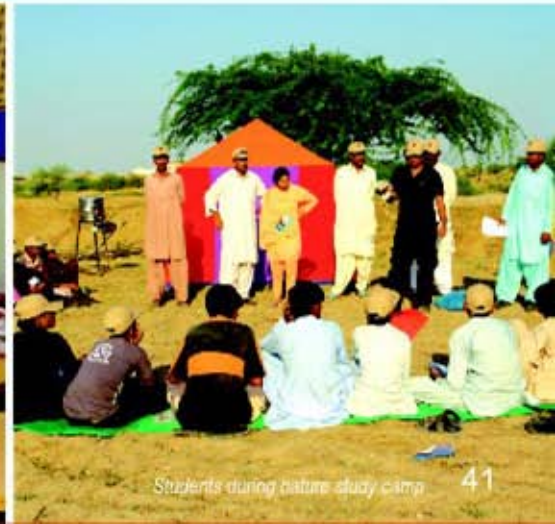

Celebrating World Wetlands Day-2009 at Keenjhar Lake

Promoting Environmental Awareness in Schools

The Programme is also training schoolteachers in Environmental Education to promote it among schoolchildren, establishing nature clubs and celebrating significant environmental days in the schools of its target areas. At present, twenty-one teachers (both male and female) have been trained as master trainers in Environmental Education. They have in turn started training other teachers and so far 18 have been trained during the course of one field-based teachers training.

One nature study camp has been organized for thirty-two student from eight of the target area schools. During the course of this study camp the children were taken to various locations around the lake on a two-day nature camping event. The students learned about the wilderness around the lake and interacted with nature. In addition, schools of the target areas jointly celebrated World Wetlands Day-2009 in a grand ceremony organized at Keenjhar Lake. The students took part in various campaigns like an awareness raising walk, cleanliness of the tourist spots and placement of dustbins around the lake.


Master Trainers Training in Environmental Education


Students during nature study camp

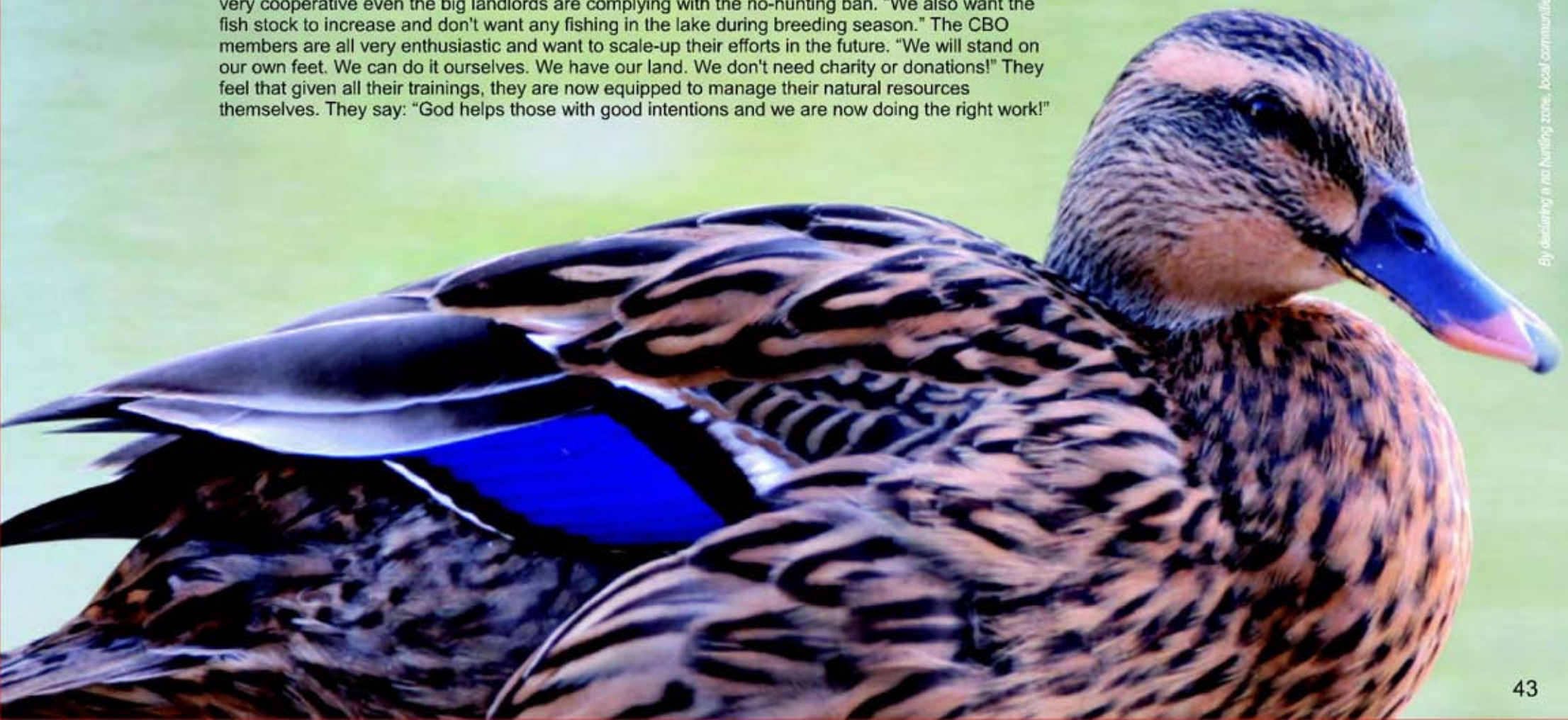
Jhimpir village was famous for its date trees

"It is time to give back to the lake..."

Jhimpir Village is a very old settlement, located near the national railway track that connects Karachi to the rest of the country. The houses here are large and well built. Clearly Jhimpir has seen better times in the past. In fact, it was once well known for its hundreds of date palms many of which have died out since the water table has gone down in the town. The office of the Jhimpir Youth Organisation (JYO) is located on the top floor of one of the large houses in the villages. The President of the JYO says, "It is not just young people who want to work with us, but also people who are young at heart!" He adds, "People here are surviving because of the lake, there are no government jobs. We have taken a lot from the lake but now it is time to give back by helping to protect it. If people start recognizing the lake as their own, then they will take care of it." People in Jhimpir have skin problems and stomach illnesses because of consuming the polluted water from the lake and have lost their livelihoods because the fish are nearly gone. The JYO wants to bring together the town on one platform and make the townspeople aware of the threats facing the lake. Together, they hope to come up with solutions. They want to force the industries located upstream of the Indus River to treat their waste water and they want to clean up the silt in the lake to make it deeper. They also want to enforce the ban on fishing during the two month breeding season in the summer. "We have found a platform to speak on. Together we will work on achieving our goals."

'We have our land, we don't need charity'

Near the Amirpir settlement, a vast tract of land has been declared a 'no-hunting zone.' One can see the signs along the dirt track saying 'No hunting allowed!' Most of these signs have been put up by the local villagers themselves. In a field nearby where farmers have started a 'farmer field school' they are planting one acre of fast growing eucalyptus trees for alternative fuel and falsa and shahtoot trees for their fruit. "There were once thousands of partridges in the area, now they are slowly coming back since we have stopped the local people from catching them," says Abdul Hameed of the Keenjhar Marro-Ara Welfare and Development Organization (KMWDO). "I used to be a hunter myself, and now I have stopped hunting completely." Abdul Hameed says the villagers have been very cooperative even the big landlords are complying with the no-hunting ban. "We also want the fish stock to increase and don't want any fishing in the lake during breeding season." The CBO members are all very enthusiastic and want to scale-up their efforts in the future. "We will stand on our own feet. We can do it ourselves. We have our land. We don't need charity or donations!" They feel that given all their trainings, they are now equipped to manage their natural resources themselves. They say: "God helps those with good intentions and we are now doing the right work!"



By declaring a no hunting zone, local communities are trying to protect birds from hunters

Keenjhar Lake provides refuge to a variety of resident and migratory birds

Preserving and Protecting

Pai Forest

Traditional farming practices are still alive in the villages surrounding Pai forest

Preserving and Protecting Pai Forest

A view of Pai Forest and surrounding farm lands

Pai Forest, which is spread over 1,900 hectares and located in the midst of agricultural fields off the Sukkur-Karachi highway, has somehow survived the ravages of time. Perhaps because it is a designated Game Reserve, the Forest Department has managed to protect it (although there have been encroachments by various government agencies and feudals).

Pai Forest was once a natural riverine forest but it was separated from the Indus River when a flood protection embankment was built along the river banks during the British era. Pai is now an irrigated forest ecosystem. However, it still has many of the same tree species one would find in a riverine forest: Babul, Kikar and Kandi. There are also some Hog deer left in the forest, along with Partridges, Wild boar, jackals, foxes and Jungle cats. The forest has been used for sport hunting for many years now primarily by VIPs hunting partridges.

The forest is home to over 60 species of birds. The more colorful birds are the Eurasian collared doves, Red collared turtle doves, Green bee-eaters, Jungle babblers, Purple sunbirds and Rose ringed Parakeets. There are other more special visitors who are migratory birds like the Green pigeon. There is currently an eagle that is nesting in the forest. It appears that due to the cutting down of nearby riverine forests, Pai forest has become a sanctuary for these birds.

A variety of birds inhabit Pai Forest

Pai forest was taken up for systematic conversion into an irrigated plantation from 1960 onwards. Most of the areas planted with Shisham during 1960-61 to 1969-70 under the first development scheme were invaded by Kandi due to fires and shortage of canal water. Presently 1,299 hectares

Pai Forest is home to a variety of birds and animals

are under Babul, 107 hectares under Eucalyptus, 10,451 hectares under Kandi and 12 hectares under Shisham. Thus the total stocked area is 2,463 hectares, which is 85 per cent of its total area. The theft of sanctioned water and unchecked wood cutting are causing serious threats to the Pai Forest.

Pai Forest is now irrigated by canal water

There is a shortage of water in the Rahib Shah minor canal which is supposed to irrigate the forest. The canal gets sanctioned water from the nearby Rohri Canal, however influential landlords have siphoned off the water for their own use and since the forest is located at the tail end of the canal, it hardly receives any water. The landlords are also slowly encroaching upon Pai Forest land. The forest is surrounded by irrigated agricultural land where crops like cotton, wheat, oil seeds and sugarcane are grown. There are also a number of banana orchards, which have become a cash crop in the area in recent years.

The local villagers also cut trees in the forest for fuel wood. They graze their animals in the forest, damaging the young trees. Over the years, 13 tube wells have been dug in the forest to provide water to the trees and animals. Only 9 are operational, however, this is still not enough to meet the water needs of the forest. It is facing drought conditions

A tube well in Pai Forest

which have resulted in loss of fertility, erosion and hardness of soil.

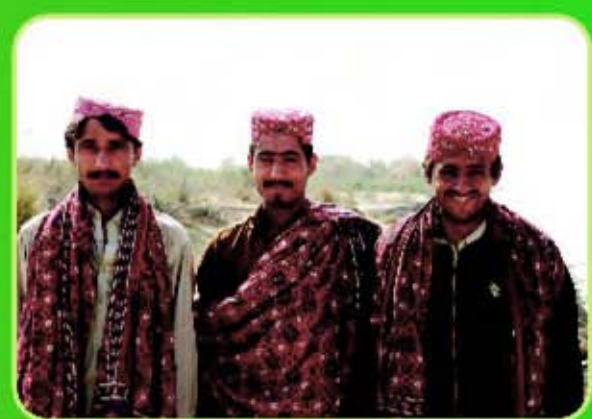
Locate communities collect fuel wood from Pai Forest

The Indus for All Programme has mobilized the local communities who live around the forest to protect the area. There are around 22 villages located around the forest most of the villagers are dependent on agriculture and wage labor (57 per cent) and livestock (18 per cent). So far 14 memorandums of understanding (MoUs) have been signed with existing and new community-based organizations (CBOs) (5 female and 9 male). A total

A community consultation

of 7 new CBOs were formed (2 female and 5 male).

The villages have a mix of ethnic groups including Sindhi castes, Baloch tribes and Punjabi/Seraiki castes. The education infrastructure is widespread but health facilities are lacking. The area has a number of local civil society organizations and advocacy groups. CBOs and NGOs were already functional in 57 per cent of the villages in the Pai site prior to the Programme's interventions.



Proud of their heritage

The project staff has trained 29 CBO office bearers. Twenty three CBO members were trained in proposal development and 51 CBO members were taken on two exposure visits (22 female, 29 male). The CBOs have now developed individual work plans and two CBOs even succeeded in winning project funding for their proposals. Through workshops, resource user groups have been sensitized in the context of non timber forest products and rangeland management.

Training CBO members in proposal development

The Programme is also planning to build a watch tower (equipped with binoculars) and a proper gate entrance to the forest. The Forest Department has already signed a MoU and is willing to cooperate.

Most of the village leaders have identified lack of irrigation water, illegal wood cutting, unemployment and high incidence of disease as major issues. Two villages are distinctly noted for local CBO activity and organizational experience: Ghulam Hyder Bhutto and Rasool Bux Keerio. The communities living there have initiated a watch and ward system to protect the forest and wildlife. In fact, the local people have become so aware of the threats to the forest now, that when some outsiders tried to enter the forest and cut trees, they fought with them and chased them off.

The main conservation priority for Pai Forest is to halt the destruction of the remaining habitat and rehabilitate it by ensuring continuous water supply. The canal is being lined and the line departments have been compelled to release the required water. A sense of ownership has been generated amongst the communities and both logging and poaching has stopped. In addition the Programme is implementing a two-year hunting and trapping ban on the two partridge species found in the forest and have introduced blanket protection of Hog deer for an unlimited period. The Programme has also helped install bio-gas digesters in villages around Pai Forest for the provision of alternate energy.

Linkages have been developed between the local communities, local government and other NGOs. Women in particular have been mobilized and are participating fully in Programme activities. Livelihood plans have been developed with community consultation. The local media is also writing about Pai Forest and the problems it faces, thereby raising awareness about the importance of saving this precious forest. The Programme is proving that the local people can manage and improve their natural heritage if they are given the necessary technical support and guidance.

Black Drongo

Women Take Charge

Local women taking active part in Programme interventions

A female community-based organization (CBO), the Marvi Aurat Tarqyati Tanzeem, based in Mari Jalbani village near the forest, has re-started a middle girls school that had been closed for almost 10 years. There are now primary and middle classes for girls until Class 5. Nearly 45 girls are enrolled in the school and the members of the CBO have volunteered to teach until other arrangements are made. Another member of the CBO has now been appointed as a school teacher. The government's District Coordinating Officer has also helped them by arranging for a qualified teacher to be transferred to the school. The school has been operational for almost a year now and is the only one for girls in the area. Just in front of the school, the CBO (composed of 30 members) is planning to open a vocational center where members can acquire tailoring skills.

Teaching Children About Nature Conservation

Ayaz Jatoi, began an informal school in small room near his house, when he started teaching all the young boys and girls in his village who would otherwise spend their day playing in the fields or wasting time at tea shops. However, after forming a CBO in his village with 20 other members, he, with the help of project staff, sought permission to use the abandoned local government school (the teacher had long since stopped coming to this far off village near Pai Forest). Today, he teaches children about the importance of improving the environment and saving the forest. His cousins have also demonstrated their concern for the forest by physically chasing off some outsiders who had come to the forest to illegally cut trees. "The forest is our asset. We won't let others come and spoil it. We now understand what conservation is and we are going to work for it," he says.

Students attending a CBO run school

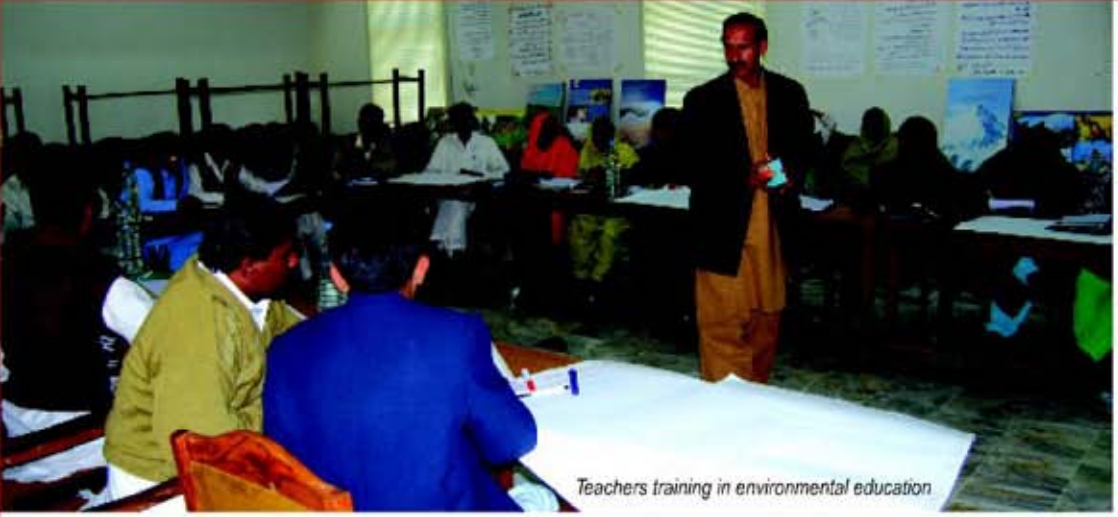
Festival For Awareness

After organizing a successful medical camp in the area in which over 785 patients were treated for free and a livestock vaccination camp, the project staff with the help of the CBOs organized a festival in Mari Jalbani Village for environmental awareness. Nearly 2,500 participants were sensitized to environmental and conservation issues. During the festival, cultural groups and local singers used their performances to highlight environmental themes.

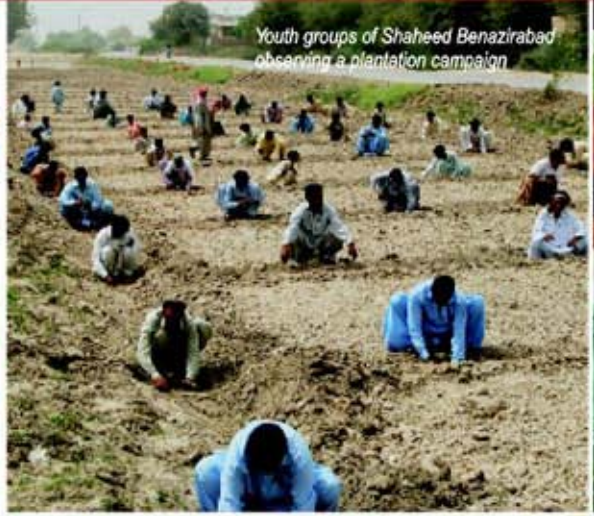
Better Management Practices

The project staff has also conducted trainings in Integrated Pest Management and four farmers have been trained as master trainers. They can now train other farmers through farmer field schools, using demonstration plots on land donated by the community.

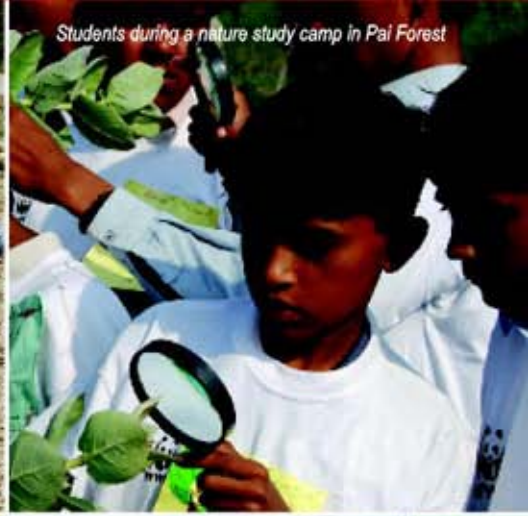
A view of the farmer field school near Pai Forest



Teachers training in environmental education



Youth groups of Shaheed Benazirabad observing a plantation campaign



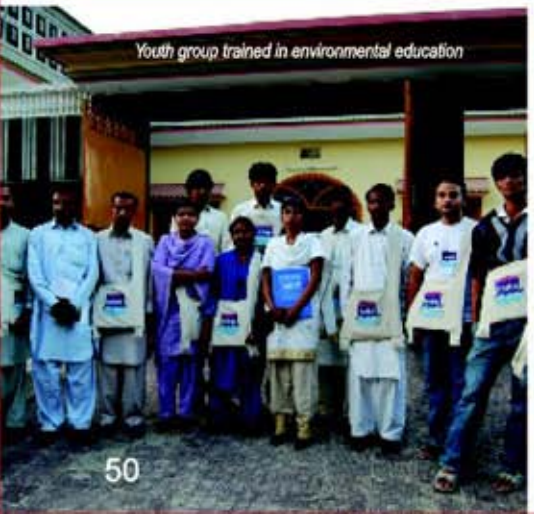
Students during a nature study camp in Pai Forest

Promoting Environmental Education in Schools

In order to promote Environmental Education (EE) in schools of the target areas, the Programme trained nineteen senior schoolteachers (ten male and nine female) as master trainers. Like the other Programme sites the master trainers are supposed to train other teachers in EE and so far more than thirty teachers belonging to various schools around Pai Forest have been trained in EE.

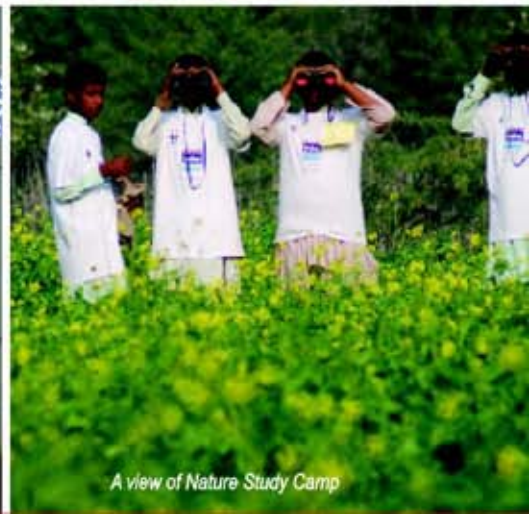
Nature clubs have been formed in the target schools. Numerous activities have been organised in these nature clubs to sensitize students on various environmental issues. These activities include: spellathons, nature study camps and celebration of significant environmental days.

Master Trainers Training in Environmental Education



Youth group trained in environmental education

Students at Pai Forest celebrating Biodiversity Day 2009



A view of Nature Study Camp

“This is a big opportunity for women…”

In a small purpose-built room with two windows and a small door, 20 women are busy sewing and cutting cloth at their workstations. They are all members of the Kiran Taraqiati Tanzeem, a local female Community-based Organization (CBO) located in Thalli Village near Pai Forest. One of the CBO members has donated land for the vocational centre and the women built the ceiling and the floor of the centre themselves. "We opened the centre in August 2008. WWF gave us the machines and the furniture" says Hameeda proudly, the President of the CBO.

Approximately 35 women are being trained in sewing and cutting in three shifts (morning, noon and afternoon). Ten women have already started earning approximately Rs. 1,000-1,200 a month through their stitching. “We get orders from nearby villages,” they explain. The centre is doing so well they also hope to construct washrooms nearby from the Rs 100 they charge each member per month for using the centre. An executive committee runs the centre and buys the threads, cloth and pays the electricity bills. The project staff gave the CBO administrative training on how to maintain the centre.

The project staff has also trained 32 women in product development, designing, bangle making and understanding color schemes. They make small bags, mobile phone covers, greeting cards and cloth bangles which are being marketed and sold in the larger towns like Karachi. “This is an important source of income for us,” explains Hameeda, who enjoys running the centre. “It is a big opportunity for the women of the area as well and there has been a rush of women wanting to register with us. But we have no more capacity we are already running three shifts!”

The centre has been so successful that the adjacent villages are asking the women who run the centre to lend them a trained woman who can teach them as well. “They are willing to give the machines, building etc. They are just saying, send us a teacher!” The vocational centre is meticulously run by the women's group, with registration fees, attendance records, account keeping and bills. Next to the centre the women also plan to set up a nursery with flowers and seasonal vegetables. “We would like to promote kitchen gardens in the area. We have already received training from the Agriculture Training Institute,” they point out.

The women of Thalli village are now generating their own income through alternative livelihood options and no longer need to cut trees from the forest to sell the wood in the market for money. This change will not only help to save the forest but also build a better life for these women.

Glimpses of the women's vocational centre at Pai Forest

Dr. Ghana Shyam Gurung, Conservation Programme Director, WWF Nepal visiting vocational centre at Pai Forest

“We no longer cut wood from the forest…”

In the village of Mari Jalbani near Pai Forest, the streets are not paved and there is no proper sanitation. There is cow dung everywhere, but Abdul Rasool Samu is lucky because he can use this cow dung to run in bio-gas unit. A government servant with 9 children (4 sons and 5 daughters), he is more than happy with his bio-gas digester, which is the only one in the village. He owns three cows himself, and the dung is used to run the unit which produces enough gas to run his stove all day.

“I used to spend Rs. 700 a month to buy wood. Now I can save that money,” he points out. In addition, he can use the fertilizer produced by the slurry in the bio-gas unit when it is time for cotton sowing. He owns agricultural fields nearby so he no longer has to buy any fertilizer for planting. “There are many benefits to having this bio-gas unit!” he says. The bio-gas unit in his backyard was installed by the Shah Latif Welfare Association (SLWA), a partner NGO who received funding for installing bio-gas units in villages around Pai Forest from the Indus for All's Partnership Fund. The SLWA was founded in 1997 and is working for health, education and environment protection in District Shaheed Benazirabad (formerly known as Nawabshah).

To date, the SLWA have successfully installed 7 units in nearby villages, while the Programme Implementation Unit in Pai Forest has installed 3 units. One of their units has been installed in the home of a tenant farmer who works for the seed corporation, whose lands are adjacent to the forest. “We no longer cut wood from the forest. Before, we used to go there every day for fuel wood,” says one of the tenant farmers. Their bio-gas unit produces enough gas to light a lantern at night and run their stove three times a day to make tea, bread and cooked food.

Both the SLWA and the Programme are now focusing on installing bio-gas units in these smaller hamlets where no gas is available, as gas connections are currently being given to larger villages like Mari Jalbani. Slowly, local residents are becoming less dependent on fuel wood. This change will help to save Pai Forest in the long run.

A household in a village near Pai Forest preparing for biogas plant installation

Installing a biogas plant

Using biogas for cooking

Biogas Plant

Changing Lives in

Chotiari Reservoir

A typical boat ride across Chotiari Reservoir

Changing Lives in Chotiari Reservoir

Chotiari Wetlands Complex: a unique blend of wetlands and desert

The Chotiari Wetlands Complex, as it is known, is one of the most biologically diverse places in Pakistan, home to Marsh crocodiles and Hog deer. Chotiari is located at the junction of deep lakes and shallow marshes, bordered by sand dunes, agricultural land and a riverine forest. It is situated in the Thar Desert approximately 30 km from the town of Sanghar in interior Sindh. The Chotiari reservoir was created out of a natural depression along the left bank of the Nara Canal. Its construction began in 1994 and was completed in 2003.

The reason for the construction of the reservoir, which is spread over 18,000 hectares, was to store rainwater and flood water from the nearby Indus River (during the monsoons) for use in times of drought. The reservoir area consists of a number of large and small freshwater and brackish lakes which are a source of fish for the local fishing communities and a home for crocodiles, otters and freshwater turtles.

The Reservoir has altered the areas ecosystem

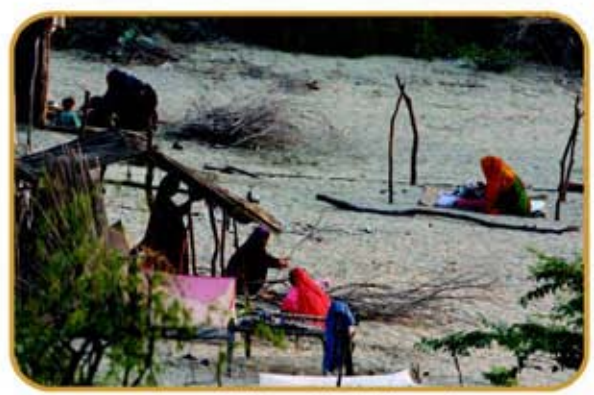
The lakes are also a feeding and nesting ground for a variety of resident and migratory birds. Over 80 bird species have been recorded in the area and there are more than 200 plant species.

Rising water table has negatively affected traditional fishing practices

The main communities in this area are the fishermen, mat makers (who make mats from the typha grass that grows freely near the reservoir and the Nara canal) herders (who depend on their livestock) and agriculturalists (mostly tenant farmers or seasonal labourers who work in the nearby cotton and wheat fields). Ninety five per cent of the people thus depend on fishing, agriculture and livestock. Many of the people who live in this area are followers of Pir Pagaro, their spiritual leader who lives in nearby Khairpur District. Every 3-4 years, he visits the area and is given a warm and festive welcome.

Rising water table has submerged adjacent rangelands

Nearly 30 villages with a total population of 13,915 are located around and inside the reservoir. Most of the residents live below the poverty line and the area lacks basic social services and infrastructure facilities. People live in thatched huts without any electricity or piped water or even metalled roads. They are completely dependent on the available natural resources for their survival.



Community life near Chotiari Reservoir

Local communities get water from the reservoir for their livestock and fodder and fuel wood from the nearby grazing lands and from the nearby Makhi forest. Most of the locals are unhappy with the construction of the reservoir. Some people lost their land when it was submerged by the reservoir, and they still have not received any compensation. The locals say that the construction of the reservoir with its long embankments and dykes built to convert the different lakes into a single reservoir has disturbed the natural flow of water into the lakes and spoilt the water quality in some of the lakes.

The reservoir was also intended to increase the production of fish in the area but that has not occurred as there is an irregular supply of water into the reservoir. Either the reservoir has too little water or too much water. When the water level goes down, the fish production also declines. This irregular water supply has also contributed to the loss of flora, which in turn contributes to the decline in fish production. This decline has had a severe impact on the livelihoods of the local fisher communities. The rangelands and pastures degraded due to the construction of the reservoir, have also adversely affected villagers. There is also rapid degradation of agricultural land around the reservoir due to seepage of water.

The construction of the reservoir has also disturbed the habitat of the unique wildlife species found in the area. Two important species, the Gavial and the Smooth-coated otter, are on the verge of extinction. Hog deer is an endangered species of the area. Degradation and shrinkage of habitat is one of the main reasons for the decline in Hog deer population. There is a lot of hunting in the area particularly of the Chinkara, Houbara bustard, partridges and other migratory birds, especially ducks. The Marsh crocodile is also hunted for its skin but this practice is now declining due to the international ban on the trade of crocodile skins. As a result of unsustainable fishing practices (over fishing and the use of harmful nets), fish stocks are also being depleted in the lakes. Around 60 species of freshwater fish have been recorded in the lakes. These include Rohu, Dahi, Popri, Makhni and Morakhi.

The fisher communities living around the reservoir, represented by the Pakistan Fisherfolk Forum, are partners of the Indus for All Programme. The Programme is trying to improve both conservation activities and livelihoods in the area. During the its first year, the Programme focused on completing ecological surveys and socio-economic studies and forming Community-Based Organisations in the area. Five new CBOs were formed including one female CBO. MoUs were signed with 9 CBOs (five new and four existing). CBO members were sensitized about the use of natural resources and were Given trainings in organizational management and proposal writing.

The area is home to a variety of waterfowl

In the past one year, the Programme has helped install solar energy units in selected areas. The Programme has established a vocational centre in Chotiari and 20 girls have been trained in cutting, sewing and hand embroidery work. The women of this area make embroidered bed covers (rilis), stitching them with colourful pieces of cloth in traditional patterns. It takes them over a week or so to make one rili and these can easily be sold in large towns and cities to generate income. Thirty five women artisans have also been trained in product and color scheme development, pattern making and designs. They are now making bags, wall hangings and mats. Workshops in health and hygiene for women have also been conducted.

The Programme is also establishing a nursery for alternate fuel wood in the area so that locals will stop cutting trees in the Makhi forest. Already, there has been widespread deforestation in the area on account of agricultural expansion and the increasing demand for fuel wood in Sanghar town. The Programme is also completing an information centre located near Baqar Lake for community meetings. The government donated land for the centre and the Forest Department provided timber for its assembly while the local communities helped with its construction. Designed by a local architect in a traditional style, the Indus for All Programme will furnish this centre, and intends for local CBOs to run this centre with the support of project staff.

Consultative workshop with religious leaders to enlist their support in awareness raising

A local festival organized at Chotiari to disseminate conservation messages

The Indus for All Programme has also asked local religious leaders to give sermons on Islam and conservation. A total of 33 religious leaders participated in two consultative workshops and were engaged to disseminate messages on the environment and conservation through sermons. Nature clubs have also been formed at the local schools, where World Environment Day was celebrated. More than 30 schools in and around Sanghar have been involved in nature walks, tree plantation activities, competitions, debates and tableaus about the environment. The Programme has also arranged two local festivals in which approximately 6000 people from Chotiari Reservoir and nearby villages attended. These local festivals are not only a means of spreading awareness about issues of conservation and environmental protection but also reviving local folk culture. Medical camps, visited by nearly 200 people a day, were also arranged in the Chotiari reservoir area for 3-4 days.

Local journalists have been taken on exposure visits to the Chotiari site. Both the electronic and print media has covered the threats to Chotiari's fragile ecosystem. These issues have also been discussed by the District Coordination Committee. The project staff meets with them regularly to discuss natural resource management.

The Community-based Organizations (CBOs) are now taking conservation initiatives on a self-help basis and are actively supporting the Programme's interventions. In spite of social and cultural constraints, women's participation in Programme activities has increased significantly. The network of local CBOs are on their way to managing and conserving their natural resources through better management practices, improved lobbying and advocacy. With the support of the district government and local institutions, they can certainly improve their lives.

Vocational Center Trainings

Out of the 20 women trained in the vocational center set up for women in Chotiari, 7 have started tailoring for income and earn an average of Rs 1,000 per month. The rest are stitching for their families and saving about Rs 300-400 per month. Trained artisans are already getting orders from Karachi and Sanghar town for their bags, mobile phone covers, book markers, embroidery show pieces, wall hangings among other products. These artisans have displayed their products in four exhibitions held in Karachi, including WWF's nature carnival and a South Asian Association for Regional Cooperation (SAARC) fair.

Through the Vocational centre the Programme provides opportunity for local women to improve their skills

Forming Nature Clubs

A pitcher water filtration system developed by the nature club of Government High School Choudhry Barkat

A 'Bird Lovers Model Nature Club' has been formed at the Government High School, Choudhry Barkat, while two more are being organized. The project is targeting at least 15 high schools near Chotiari. The 'Nature Club' consists of a classroom equipped with environmental education kits located in a school where approximately 25 children can learn about conservation from a teacher trained in environmental education. Since many of these children might otherwise grow up to become hunters, this exposure at a young age to conservation issues will have a strong impact on them. The project staff has also installed a 'Bio-Sand Nadi Water Filter' at the Government High School to provide clean drinking water to the children through the use of clay pots which filter water from nearby streams. The nature club members meet every week and are taught to protect animals and to keep their school and home environment clean. They hold drawing competitions, write speeches on the environment, visit the reservoir and other schools and plant trees during the monsoon season.

Organizing Nature Study Camps

To inculcate a sense of nature stewardship among young people, the project staff helped 8 students from schools around Chotiari Reservoir and a staff member to participate in the National Children's Mountain Conservation Meet in 2008. The event was organized by the Adventure Foundation of Pakistan in Kaghan Valley in July 2008. At the meet, the children participated in a variety of activities to enhance their connection to nature. These included trekking, wilderness study, team building exercises, basic camp craft and solid waste management.

Children from Sanghar took part in National Children Mountain Conservation Meet -2008

Engaging Youth in Improvement of Public Places

The Civil Hospital in Sanghar did not have any green lawns and in fact, garbage was dumped on its grounds. The members of a youth group formed by the Programme undertook to clean the hospital's grounds and introduce greenery by planting 300 trees. The youth group also installed 7 waste bins in the hospital grounds. This was done completely on the members' own initiative, although the saplings and waste bins were donated by the Programme.

Local youth voluntarily improved a public hospital grounds in Sanghar

Installing Solar Units

A total of 7 units of solar energy were installed at 5 different villages (school and mosques) in the area. In the mosque located near the Chotiari reservoir, in the village of Phullel, installed with the help of PCRET (a government institution) each unit produces enough electricity for two fans and four energy saver bulbs. There is no electricity in this village, so the solar powered energy is greatly appreciated. While the solar panels can last for 40 years, the batteries have to be changed every 3 years. The people of this village are completely dependant on the reservoir for fishing and they say that there is limited fish in the reservoir and hardly any water. They want the government to release more water from the Indus River into the reservoir.

Solar Panel installed at mosque with PCRET's support

Declaring a Partridge Reserve

In the Avadh area of Chotiari, nearly 8000 acres of land have been declared as a partridge reserve by the local people. No one is allowed to hunt here. In fact, the people of the area have handed over this land to their spiritual leader, Pir Pagaro, so no one dares to hunt here! Both grey and black partridge are found in the reserve. The local communities are committed to protecting their natural resources. Three CBOs have declared no hunting zones in their surrounding villages as well. Nearby is a community energy plantation for alternative fuel wood (Acacia), planted by the Avadh Development Organization on donated land. Almost 4.42 hectares of land have been planted in 5 different locations under the three different CBOs. The project staff only provided the saplings while the communities planted the trees themselves on their own land. A total of 10 hectares will be planted around the reservoir.

Introducing Farmer Field Schools

Farmer Field School (FFS) is a well-tested approach that is based on the concept that the best learning tends to be experiential based on 'learning by doing' and observation. These field schools engage farmers and encourage them to not only learn scientific methods of cultivation and increase earnings from their crops but also share their personal experiences and build their capacity for informed decision making.

A total of four farmers have been trained as Master Trainers in the Chotiari area. One Farmer Field School has been established and a demonstration plot of wheat crop has been cultivated on the basis of Integrated Pest Management practices. Now the farmers want to plant cotton on their next demonstration plot. As many as 25 farmers were trained in the last session and they found the school to be very useful. Classes were held once a week on Sundays. A local farmer lent the land for the demonstration plot. According to the farmers who attended the school, they learnt better cropping methods and how to minimize the use of pesticide effectively. They also learnt about the best time to put in fertilizer and when to water their crops. They learnt to plant more seeds with less space in the middle, which produced more wheat. They are now eager to learn how to sow cotton using better techniques from the Master Trainers. Attendance at the field school is high and there is even a Rs. 20 fine for those who miss class!

Local farmers learning about sustainable farming practices

Building Capacities of Local Communities

A three-day training workshop on "Project Proposal Development" for community members and other partner organizations from District Sanghar was organized from 23 to 25 March 2009. Held at the site office in Sanghar, the training was attended by twenty participants including three women. The training taught participants how to develop project proposals for various grant opportunities. The training focused on project cycle, stages of proposal development, concept and definition of monitoring and evaluation.

A second training on "Monitoring Natural Resource Use" was organized for CBO representatives from district Sanghar on 19 and 20 March 2009. Twenty-one representatives from ten local CBOs attended this workshop which was facilitated by two programme staff from Keenjhar and one from Chotiari. The training was aimed at enhancing the knowledge and skills of selected community members in monitoring the existing status and future trends of available natural resources.

School Teachers Trained in Environmental Education

As part of its aim to promote Environmental Education in target area schools, the Programme has trained eighteen schoolteachers (ten male and eight female) as Master Trainers during a five-day training event held from 26-30 August 2008. These master trainers are mandated to train other school teachers through field-based teachers training in environmental education. In this connection, thirty school teachers from fifteen primary schools in Chotiari have been trained in a two-day workshop held from 18 to 19 December 2008. The trainees are instrumental in establishing nature clubs and integrating environmental education in the school curricula.

Training of teachers in environmental education

Training community members in natural resource use monitoring

A training session on proposal development

Training Master Trainers in environmental education

A presentation delivered during a women's awareness workshop

“I don't want to kill animals…”

The Government High School, Chaudhry Barkat, is located off a quiet road in the middle of agricultural fields, outside the town of Sanghar. The school is remarkably clean and there are garbage bins bearing WWF logos all over the campus. The grounds are also very green, with small shrubs and trees. “The children, especially the members of the Nature Club, keep the school very clean,” says Khan Muhammad one of the teachers at the school. The classroom where the 'Bird Lovers Model Nature Club' is located is also a neat room adorned with colorful paintings of animals and birds. There are special environmental education kits stored in the cupboards for use during the Nature Club meetings. Outside the classroom is a 'Bird Lovers' corner where the children can feed the birds. “We take the students to Chotiari Reservoir and teach them about fish, birds and animals” explains the school teacher, who has been trained in environmental education by the Indus for All Programme. Two of the teachers at the school are master trainers and can impart environmental education training to the other teachers.

Thanks to the 'Model Nature Club', the school has come to the attention of the local Union Council Nazim, who attended one of its programmes, held on World Environment Day, when the children made speeches, sang songs and narrated poetry. The Council Nazim gifted the school with a water cooler and fixed the broken road leading to the school. The 'Model Nature Club' is quietly bringing a change in the area as the children who learn about hygiene and conservation in the club share this information with their families. According to Mohammed Akram, a student at the school and a member of the Nature Club, "I never want to hunt. I don't want to kill any animals."

A view of the Nature Club at Choudary Barkat High School in Sanghar

"We want to see animals in the wild…"

Just across the Nara Canal lies the village of Ghulam Hussein Leghari on the outskirts of Makhi Forest (named after the small bees that make their honeycombs in the trees inside the forest). Makhi Forest was once famous for its rich reserves of quality honey, commercially valued wood and plants with medicinal values. The forest was also the stronghold of the freedom movement launched by the Hurs (followers of Pir Pagaro) against the colonial British power during the 1930s. During the uprising, the Hurs would hide in the forest. To suppress the "Hur Revolt", the British rulers converted a large part of these woodlands into agricultural areas. The recent rise of water in the nearby Chotiari Reservoir has also damaged much of the forest.

The Makhi Development Organisation is a community based organization of the area, which was registered in 2008. The local people living in and around Makhi Forest are completely dependent on the forest for their livelihoods. They moved here in the 1970s and settled in the forest. Explained Khalid Ali, the President of the community-based organization (CBO): "Over the years, we had killed almost everything in the forest all the animals and birds and we chopped down so many of the trees. Then the WWF people arrived here around two years ago and they started talking to us, explaining that the forest belongs to us and we have to save it for our future well being. The Legharis are in fact famous for being hunters and now we are saving the animals!"

Hog deer, desert hares, jackals, otters, Wild boars and crocodiles were once found here in abundance. "We are very aware of the fact that we need to save these animals now. We don't want to just read about them in story books. We want to see them alive, in the wild", said another member of the CBO. There are currently 6 villages involved in the Makhi Development Organisation (the size of the villages range from 100 people to 1000).

The CBO is now planting more trees in the forest and with the help of the Indus for All Programme, they are introducing bio-gas units (which run on buffalo and cow dung) in the biggest village. Two units (which can provide gas for the stoves and energy saver bulbs for 3 houses each) are currently being installed. The units will help reduce wood cutting as source of fuel wood. This is being done on a trial basis. If the initiative is successful then the number of bio gas units will increase.

Makhi Forest is in a very remote area, with no hospitals or schools nearby (the nearest boy's school is 2 km away). However, residents feel that they are rich in resources as the honey from the forest is highly valued and they can sell it for as much as Rs 700 per bottle. "We receive orders from all over the country for this honey," pointed out one villager. The forest is also used for grazing by livestock from the village. Goat droppings actually help regenerate the forest by spreading seeds. "It's the people who are the biggest threat to the forest. They cut the wood and sell it in nearby towns and cities. But we've managed to put a stop to that. It is in our control and we have stopped the logging," said Khalid Ali. The forest is slowly regenerating and the animals have started coming back. The water level in the nearby Chotiari Reservoir has gone down now, and a new forest is starting to grow. Makhi Forest might yet live up to its famous past.

A landscape near Chotiari Reservoir

A unique blend of wetlands and desert make the habitat of Chotlan Reserve

Lessons Learned and Challenges

A scenic view of Chobiarl in the evening

Lessons Learned and Challenges

The backdrop of this period (July 2008 June 2009) was one in which Site Offices were renewing their engagement with new appointees to District Governments. Programme activities continued alongside this process. The inherent challenge was to revitalize our institutional relationships by sustaining the pace at which our field and policy work is introduced in government planning.

The Indus for All Programme's collaborative research programme, which depends on strong ties with academic institutions both in Pakistan and abroad, has also been hindered as a consequence of the troubled law and order situation, which has been exacerbated by rapid political changes. Nonetheless, the Programme has continued to invest time and effort in its academic outreach efforts. It continues to attract graduate students and doctoral candidates interested in pursuing high quality field based research in Pakistan.

In this period, conservation work accomplished by the Programme experienced a setback as prices of fuel and staple goods rose, which had an impact on activity costs. In particular, the poorest beneficiaries at all four sites redirected their efforts towards increasing their use of natural resources since their incomes were strained. The Programme dealt with this shift by redoubling its environmental education and awareness raising efforts. It also brought home to the Programme the value and timeliness of engaging in poverty and environment research to guide field activities.

The Programme's management approach continues to evolve. One challenge has been to shift from an "output based billing" system to an "input billing system." This change in financial management has obliged Programme staff to shift attention from Programme activities to learning new operational procedures. Another challenge is keeping pace with a competitive market place in terms of retaining staff who are rich in experience and expertise. This is particularly trying for a Programme that relies heavily on staff posted in the field.

Perhaps the most heartening lesson for a Programme with a long term vision, and one that plans to work in eleven other sites up to 2050, is to witness change among those who will ultimately manage natural resources independently. Proposal writing workshops for community-based organizations have already begun to bear fruit. For instance, the Shah Lateef Welfare Association was awarded a Partnership Fund grant to build a biogas unit at Pai. A lesson to be learned from the follow up to this is the initiative taken by the Programme to monitor usage efficiency and feasibility of introducing improvements associated with all such units. A major challenge will be to persuade Programme stakeholders to recognize the value of these initiatives and bolster community organizations.

Another valuable lesson has been to safeguard long standing traditions of conservation. Traditional ecological knowledge (TEK) is being lost rapidly. In recognition of this tremendous loss of indigenous knowledge, the Programme is in the process of completing a TEK study encompassing the Lower Indus Basin. In future, the Programme plans to protect and promote the intellectual heritage of the Indus Ecoregion through other such initiatives.

The Programme successfully underwent its first external monitoring mission. The Embassy of the Kingdom of the Netherland's sponsored monitor assessed the Programme's progress to date. Between 28 February and 19 March 2009, the monitoring mission visited the Programme's four sites and met with staff as well as stakeholders. Among stakeholders with whom meetings were held were the Additional Chief Secretary (Dev.) Planning and Development Department, Government of Sindh, who also chairs the apex body of the Programme - the Indus Ecoregion Steering Committee, the Secretary Forest and Wildlife, the Secretary Livestock and Fisheries, the Conservator Sindh Wildlife and the Friends of the Indus Forum. Preparing for the monitoring mission was a challenge, not in terms of meeting the highest standards of transparency and information management, but in terms of showcasing the Programme's successful field based initiatives to a non natural resources expert. The Programme learned that in future, it should stress the importance of area experts assessing the Programme and its outputs.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Future Plans

Natural Resource Management and Livelihoods Improvement

The main features of the Programme for the next twelve months starting from July 2009 onwards are the implementation of the Natural Resource Management and Livelihood Development Plans. When merged they will form the site strategic plans that will outline the main interventions needed to address key natural resource issues at the site level as well as tackling the livelihood needs of the community. The livelihoods plans identify potential interventions in two ways. First by adding value to existing livelihood systems such as agriculture, fishing and handicrafts production; secondly by diversifying the types of livelihoods that people are engaged in, like building the capacity of the community to manage eco-tourism. Under the Natural Resource Management Plans, interventions are targeting existing systems like the agriculture sector through capacity building and provision of facilities such as a milk-chilling plant and direct habitat rehabilitation such as plantation of mangroves.

Also, under the Natural Resource Management Plans, there are some policy related outputs that affect the entire province such as the revision of the Forest Act and Wildlife Ordinance. The latter does not actively support the inclusion of communities or other stakeholders in the management of wildlife resources, therefore, the Programme will assist the Sindh Wildlife Department in reviewing and revising legislation to support community-managed game reserves and trophy-hunting. The Programme is also initiating its activities in the fisheries sector, targeting both marine and freshwater fish. A fisheries plan will be developed by the end of 2009 with the aim to raise the income of poor fishing communities. The Programme will also extend training to the Sindh Fisheries Department to enable them to undertake important tasks such as fish stock assessments and introduction of aquaculture, all with the objective of allowing them to assist fishing communities in managing fisheries resources and improving their lifestyles.

The Better Management Practices (BMP) at all four sites will continue throughout 2009 and will diversify its ways to improve the crop production with existing resources. This may include installing drip-irrigation units and developing manuals in Sindhi for farmers to use as reference materials.

The Programme will also be implementing **'Constructed Wetlands'** for communities in Sanghar and Nawabshah with the help of UN-HABITAT Nepal. Dr. Roshan Raj Shrestha, the Chief Technical Advisor for UN-HABITAT South Asia, has already visited the sites and together with the Programme plans to jointly start this initiative. This is a relatively new concept in Pakistan. Under the sustainable water and sanitation approach, the Programme is keen to promote this affordable solution to rural sanitation problems.

A Payment for Environmental Services (PES) study will be initiated over the next twelve months. Like 'Constructed Wetlands', the PES concept is relatively new in Pakistan although WWF-Pakistan has successfully implemented PES schemes in the past. In this case, the Programme has chosen Chotiari Reservoir as the target area. After conducting a feasibility study a PES plan will be developed and implemented.

Friends of Indus Forum

The Friends of Indus Forum, as an open platform, continues to advocate for the rehabilitation of lost habitats, species and natural resources. It will mobilize greater community support, lobby vigorously for nature conservation and advise both government and other interested groups on Sindh's environmental revival.

Poverty-Environment

In 2009, the Programme will have completed site-specific Poverty-Environment (PE) linkages and indicators studies. The indicators are mainly addressed to Programme staff, practitioners operating in the Indus Ecoregion, and policy-makers. They are designed to enable responses to patterns of deterioration ahead of major breaches to natural biological cycles. These reports are also intended to improve field interventions by providing guidance on ways in which poverty is a mechanism that transforms the underlying causes of environmental degradation into actions that degrade the environment. Several of the Programme's activities in the upcoming years are critically dependent on the guidance proposed in these reports. For example, a PE indicator designating a connection between income and harvesting of fish from Chotiari Reservoir by dependent communities will help target and refine intervention design, and improve activities within Chotiari's livelihood plans. Endorsed in 2009, these Livelihood Plans have yet to be implemented. A unique PE manual for the Indus Ecoregion is also being prepared to make accessible lessons from past application of linkages and indicators, relevant case studies, and decision support tools.

The Programme will also complete a Payment for Environmental Services (PES) feasibility and plan in 2009. In a PES, those responsible for ensuring preservation (sellers) of ecosystem services are paid or compensated to encourage future provision of these services. Those who benefit from the ecosystem services (buyers) are identified by WWF and invited to provide direct or indirect (non-monetary) payments. The Programme's PES research has already been registered with the Natural Capital Project Database since early 2008 (www.naturalcapitalproject.org/database.html). The Programme is consulting with WWF - Pakistan's Programme Development Unit, whose past experience of PES in Pakistan renders its advice indispensable to all research activities, including identification of: environmental threats, ecosystem service targets, landowner/land cover/land use transitions, conservation finance tools, institutional tools, social tools, and conservation activities. While this remains to be confirmed at this stage, the PES proposed for 2009 may be adapted to a Better Management Practice (BMP) agricultural model and applied to Chotiari.

The Programme was chosen by the Ministry of Environment (MoE), with the financial and technical support of the United Nations Food and Agricultural Organization (FAO)'s National Forest Programme (NFP) Facility, to prepare guidelines on how to conduct total economic valuation (TEV) studies of forests and forest products in Pakistan. The guidelines are concerned with ensuring that forest valuation studies are clearly defined, commissioned to those with the appropriate subject-area expertise, cost-effective, and of high quality. The project is 6 months in duration and is expected to be completed within 2009. The ordinary distinction in the phrase "forests and forest products" is that between wood and Non-Timber Forest Products (NTFPs). NTFPs can be derived from flora (e.g. fruits, medicines) or from fauna (e.g. honey). Both wood and NTFPs can be used for subsistence purposes but also for sale and trade. Guidelines on Total Economic Valuation (TEV) studies that place a monetary value on these natural assets will ensure that values can legitimately be used in cost-benefit analyses, green accounting, and other applications.

Work on the prestigious South Asian Network for Development and Environmental Economics (SANDEE) grant awarded to the Programme in 2008 is ongoing (www.sandeeonline.org). The grant is concerned with placing a monetary value on the recreational use of Keenjhar Lake. Besides this, the policy relevance of the study will be to illustrate how improved environmental attributes at Keenjhar will increase visitation as well as positively influence visitors' willingness to pay for recreational activities. This is a beneficial complement to the existing TEV study conducted at Keenjhar which extrapolated values associated with the following functions only: fishing (direct use), water supply to Karachi (indirect use), and perceived value of species protection as a form of value not related to current or future use (non-use). Recreational values tend to be very high as compared to the direct, indirect and non-uses just listed. A week-long survey of visitation in Feb-March 2009 revealed that visitors in excess of 1,000 per day visited the Sindh Tourism Development Corporation's resort. The majority were from Karachi (60%), followed by Thatta (14%), Hyderabad (10%) and other districts (16%).

Indus nature carnival in Karachi

Capacity-building, Communication and Awareness Raising

Under the institutional capacity-building and awareness raising component, outputs will continue focusing on training and awareness-raising among the Programme's key stakeholders and general public. The major interventions for the next reporting period (July 2009-June 2010) consist of tangible outcomes in terms of skill enhancement, knowledge management and dissemination.

Capacity building of various local partners and district governments will continue in the next year. Training will be provided in various thematic areas including organizational management, monitoring natural resource use etc. Moreover, special efforts will be undertaken to promote local handicrafts through product development, placement and innovation besides promotion of women's entrepreneurship.

The Programme plans to organize an exposure visit for district government officials to the Northern Areas to encourage closer contact with communities and government departments working on community-based conservation for the last two decades.

Pursuing robust research collaboration with some national and international academic institutions, the Programme plans to engage at least two students in research on the Indus Ecoregion. While facilitating the research activities, the Programme also intends to foster mutual collaboration among national and international universities for research programmes in the Ecoregion.

In order to sustain its relations with both the print and electronic media, the Programme intends to support the Indus Journalists' Forum with a view to augmenting green journalism. The forum was established last year as a result of the Programme's continuous engagement with journalists from the target districts including Hyderabad and Karachi. In the past, Urdu and Sindhi newspapers have carried stories relating directly to the activities of the Programme. Special attention will be paid to widening this coverage as well as paying particular attention to building the capacity of journalists from local print media.

To strengthen its school outreach initiatives, the Programme plans to establish Environmental Education Model Schools (EEMS) along with Nature Clubs in each of the target districts. The EEMS will showcase and perform a set of activities to promote environmental education among school children. The Programme also intends to provide necessary equipment and gadgets to the EEMS for enabling school children to conduct EE activities such as nature collection, preparation of exhibits, nature camping, watching environmental documentaries, gardening, plantation and solid waste management. For this purpose the Programme also plans to train a number of schoolteachers.

The Programme intends to liaise with previously trained individuals and groups to capitalize on an important investment aiming to engage stakeholders in various learning and dissemination activities. These stakeholders and activities include government officials for co-management of natural resources; representatives of CBOs and NGOs for project proposal writing and advocacy; religious leaders for delivery of sermons on conservation and Islam; youth leaders for organizing greening activities; schoolteachers for integrating environmental education with school curricula; representatives of rural women for promoting environmental health and hygiene activities.

Moreover, the Programme plans to develop a wide array of publications such as a comprehensive floral guidebook, a biodiversity guidebook and an Environmental Education Kit for schoolchildren in addition to a variety of awareness material including fact sheets, brochures, posters, flip chart presentations, newsletters and promotional items.

Institutional Alignment and Policy Support

The Programme's focus on improving and consolidating institutional alignments through strong policy initiatives is an ongoing process that is intended to run beyond the course of the current 5 year phase. The Programme's relationships with institutional actors and a diverse range of stakeholders are maintained not only through formal links such as the Indus Ecoregion Steering Committee (IESC), Sub-Committee of the IESC and District Coordination Committees (DCCs) but also through informal meetings, interactions at workshops and seminars, and frequent personalized contact.

The IESC plays a significant role not only as a stakeholder but also as a stringent monitor of Programme implementation. In order to build the capacity of IESC members, the Programme will be organizing exposure visits to other Ecoregions of significance such as China and Nepal.

Another significant thrust of the Programme is the integration of Poverty-Environment linkages into government planning and policy documents. These documents can be divided into two categories: federal and provincial planning instruments. For instance, earlier this year, the Government of Pakistan initiated phase II of its long-term poverty reduction programme described in the Poverty-Reduction Strategy Paper II (PRSP). The Programme has been successful in developing a close working relationship with the PRSP Secretariat, the primary administrative and monitoring unit for the PRSP. The Secretariat has expressed enthusiasm for the Programme's Poverty-Environment work and will be working closely to assimilate relevant indicators in their monitoring framework. Other avenues of interest at the federal level include the assimilation of Poverty-Environment linkages in the upcoming Medium Term Development Framework and exploration of the Government of Pakistan's position on climate change in light of the United Nations Framework on Climate Change and on-ground research in Programme sites.

At the provincial level, the Programme's vibrant work dynamic with different line departments such as Planning and Development, Forest and Wildlife, Livestock and Fisheries, among others has increased its effectiveness. It has allowed the Programme to make steady progress in sensitizing policy and planning documents to the relationship between environmental degradation and poverty. For example, the Programme is currently determining how best to develop a poverty-environment focused fisheries sectoral plan, which will aid in the implementation of the existing Natural Resource Management (NRM) Plans and Livelihood Development Plans (LDP). The Programme is also engaged in amending environmental legislation. A case in point will be the proposed revision of the Sindh Forest and Wildlife Acts to render them more responsive to addressing current and future concerns specifically in terms of protecting habitats and biodiversity.

Partnership Fund

The Partnership Fund will continue its grant programme in the future on a regular bi-annual basis; however, in the years to come efforts will be made to focus on projects which directly address the thematic areas of the Indus Ecoregion Plan and produce quality outcomes. In addition, the Partnership Fund will strategically help the Indus for All Programme to identify priority sites for the second phase of the Programme. In this connection, projects addressing the conservation issues of the fifteen priority sites of the Indus Ecoregion will be given preference in future grant disbursement.

The projects funded under the Partnership Fund will be continuously monitored. A proper mechanism to monitor the progress of all projects is already in place. The monitoring mechanism helps in the Partnership Fund's management and ensures that all the funded projects are moving in the right direction. Each project will be evaluated at the conclusion of the grant period to determine the contribution towards achieving the overall objectives of the Indus Ecoregion Conservation Plan.

The Partnership Fund's external review is needed to monitor grantee progress and adherence to standard operating procedures. The external review will be conducted at the end of the first year of the funding cycle. Since grantee projects started in October 2008, this activity will be undertaken in the last quarter of 2009. This exercise will be conducted by experts with relevant experience and expertise.

The external reviews will also be translated into lessons learnt for improving the Partnership Fund performance as well as for dissemination to an external audience. This will be done in order to ensure transparency of the Partnership Fund's operations. To disseminate the lessons learnt, diverse mediums including websites, publication, and media channels will be utilized. The Partnership Fund will also sponsor some widely circulated environmental journals and/or magazines to publish a special issue on the Programme's Partnership Fund to highlight the Fund's achievements.

"Let every individual and institution now think and act as a responsible trustee of Earth, seeking choices in ecology, economics and ethics that will provide a sustainable future, eliminate pollution, poverty and violence, awaken the wonder of life and foster peaceful progress in the human adventure."

— John McConnell, founder of International Earth Day

Our Mission

WWF - Pakistan aims to conserve nature and ecological processes by:

- Preserving genetic, species and ecosystem diversity
- Ensuring that the use of renewable natural resources is sustainable, both now and in the longer term
- Promoting actions to reduce pollution and the wasteful exploitation and consumption of resources and energy

Vision of the Indus Ecoregion Programme

"Mankind coexists with nature in complete harmony and biodiversity flourishes in its respective habitat"

Indus For All Programme, WWF - Pakistan

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