

Appendix 1: Itinerary of Ramsar Advisory Mission (RAM) to Pakistan

Day	Location	Start	End	Activity
Sunday (28 Oct)	Arrival Islamabad			Arrival of the Mission Members at Islamabad
				Welcome at Islamabad Benazir Bhutto Shaheed International Airport
				Night stay at Grand Mention Guesthouse, Islamabad
Monday (29 Oct)	Islamabad	0900		Arrival of guests at WWF Pakistan Regional Office, Islamabad
		0930	1030	Internal kick-off meeting with WWF and MoCC organizers, and finalization of itinerary
			1030	Meeting of Mission members with Secretary MoCC and IGF
		1030	1130	Meeting with Mr. Alamgir Khan, chief Engineer, Federal Flood Commission (FFC)
		1200	1300	Meeting and presentation by Mr. Idrees Mahsud, Director, National Disaster Management Authority (NDMA)
		1330	1430	Lunch at WWF Pakistan Islamabad Regional Office
		1430	1530	Meeting and presentation by Dr. Khalid Malik, Director, Pakistan Meteorological Department
		2000		Dinner at Marriot, Islamabad, hosted by Secretary Climate Change
		Night Stay in Hotel/Guesthouse		
Tuesday (30 Oct)	Lahore	0700	1200	Travel to Lahore by car
		1230	1330	Meeting with Mr. Imtiaz Tajwar, Secretary WAPDA, at WAPDA House, Lahore
		1330	1500	Lunch and Briefing in WWF Head Office, Lahore
		1500	1600	Meeting with Head Office, Lahore
				Night stay in Sunfort Hotel, Lahore
Wednesday (31 Oct)	Lahore	0930	1100	Meetings with provincial Wildlife, Forest and Fisheries Departments
		1200	1300	Meeting with Irrigation Department
		1330	1500	Lunch and Briefing in WWF Head Office, Lahore
		1500	2000	Lahore to Bahawalpur by Air or WWF vehicles
	Bahawalpur			Night stay in Forest Resthouse, Bahawalpur
Thursday (1 Nov)	Lal Suhanra	0830	1030	Bahawalpur to Lal Suhanra National Park and meeting with park management
		1030	1300	Field visit of lake area in Lal Suhanra to assess its potential in flood management
		1300	1400	Lunch at Lal Suhanra National Park
		1400	1900	Lal Suhanra to Rahim Yar Khan
	Rahim Yar Khan			Night stay at Rahim Yar Khan / Saluwali
Friday (2 Nov)	Guddu Barrage	0800	0930	Travel to Guddu Barrage
		0930	1300	Field visit of Indus Dolphin Reserve, Ramsar Site
		1300	1400	Lunch at Guddu Barrage (Sindh Wildlife Department)
		1400	1800	Travel to Sukkur via Tori Bund area
	Khairpur	1800	1900	Travel to Shah A Latif University, Night Stay
Saturday (3 Nov)	Sukkur	0800	0900	Khairpur to Sukkur
		0900	1200	Visit of Dolphin Information Centre, Meeting with Sindh Wildlife Department officers, Irrigation Department officer, and Indus Boat Safari

		1200	1300	Lunch at Information Centre
		1300	1600	Sukkur to Lahore, By air
	Lahore	1600	1700	Airport to Hotel/Guest House
		2000		Dinner hosted by Mr. Ali Hassan Habib, Director General, WWF Pakistan
Sunday (4 Nov)	Lahore	Full Day		Report writing and preparing for De-briefing Workshop
Monday (5 Nov)	Lahore	0900	1200	Debriefing Workshop with stakeholders
		1200	1330	Press Conference
		1330	1345	Vote of Thanks by Director General, WWF Pakistan
		1345	1500	Lunch
Tuesday (6 Nov)	Departure			Departure of the Mission

Appendix 2: Meeting at WWF-Pakistan Islamabad Office Monday 29th October, 2012



In attendance:

RAM Team: Inam Ullah Khan (Head, IUCN KPK Programme, IUCN – Pakistan), Zhang Chen (China Academy of Sciences), Xinqiao Zhang (Programme Officer, WWF – China), Lew Young (Sr. Regional Advisor Asia/Oceania, Ramsar Secretariat),

Federal Flood Commission: Alamgir Khan (Chief Engineer, Floods)

Ministry of Climate Change: Mehmood Alam (Secretary), Syed Mahmood Nasir (Inspector General Forests), Abdul Munaf Qaimkhani (Deputy Inspector General Forests), Umeed Khalid (Conservator Wildlife),

National Disaster Management Authority: Muhammad Idrees Mahsud (Director)

Pakistan Metrological Department: Khalid Malik (Director)

WWF – Pakistan: Ejaz Ahmad (Senior Director), Ghulam Akbar (Senior Director Programmes), Rizwan Mahmood (Manager Disaster Response)

Summary of discussions with Federal Flood Commission (FFC)

- Mr. Alamgir Khan (Chief Engineer – Floods, FFC) gave a verbal presentation on the work of the Federal Flood Commission, which was established in 1977 to be responsible for flood management on a country-wide basis.
- 4th Flood Management Plan: Work is now in progress to identify a consultant by the end of December to begin work on drafting this document in Jan 2013, and to be completed by December the same year.
 - The 4th Flood Management Plan will have a life of 10 years and will cover the entire Indus River Basin as well as the Kharan closed basin and the Makran coastal basin;
 - The new Plan will take an integrated approach and will look not only at how the Indus River should be managed to deal with floods but also, how the river can better managed for people, hydropower development, irrigation, navigation, recharge groundwater for drinking etc;

- 70% of the rains falls in the summer monsoon and so there are opportunities to investigate opportunities for storage of this water, e.g. by using wetlands;
- Look at floods not only in terms of disaster to be managed but as opportunities as well.
- Hill torrents:
 - Hillsides have lost about 30% of their water storage ability due to poor management. However, focusing on the hillsides at this time would not help the people in the plains who are so severely being affected by floods.
- Policy measures for flood control:
 - Although there is a Canal and Drainage Act (1873) that allows the government to clear illegal structures alongside (medium sized) river channels so that they do not constrict the flow of water during floods, such structures do exist and there is a need to remove them. Such structures and the activities of people occupying these floodplain areas also cause the loss of flooded forests and the wildlife associated with them;
 - There is a need to map the floodplains and through those maps, it is then possible to demarcate how much land can be set aside on each bank of the river to stop encroachment. New legislation on this may also be required.
- Management measures for flood control:
 - One option for dealing with floods is to construct 'escape channels' to take the flood water from the main river and divert it to surrounding areas. One such project is the on-going construction of the Raine Canal which is an off-takes from the left bank of the River Indus up-stream from Guddu Barrage, in Sindh Province. However, such projects are costly in terms of construction and maintenance;
 - The maintenance of dikes should be improved but such works are expensive;
 - There are opportunities to construct small dams and lakes to store the flood waters and these would provide multiple benefits, e.g. for irrigation, the storage of water during drought etc.;
 - It was mentioned in the discussion that Pakistan has some 200 some important wetlands apart other than Ramsar Sites which can also play an important role in for flood management;
 - In the management plans for the Indus River Dolphin Ramsar Site, the Taunsa Barrage Ramsar Sites (both drafted by WWF Pakistan) and the Lal Suhanra National Park, there could be opportunities to include management works in the plan for enhancing the ability of the sites for managing floods.
- Improving coordination between government agencies in flood management:
 - Since the 2010 floods, the FFC, NDMA/PDMA and PMO now have a mechanism for close cooperation and coordination to deal with flood management. However in the discussions, it was felt that the Ministry of Climate Change and the FFC should be involving each more and sharing information on relevant issues.
 - It was noted that the National Climate Change Policy and the National Wetland Policy could provide opportunities for different government agencies to work on issues of common interest, e.g. the use of natural wetlands for flood control.

Discussions with National Disaster Management Authority (NDMA)

- Mr. Muhammad Idrees Mahsud (Director, NDMA) provide a presentation on the 'Disaster Management System in Pakistan' to the RAM Team.

- He said that Pakistan faces a range of disaster types which the NDMA had to be prepared for, and to deal with. These ranged from GLOF, avalanches, land-slides, floods, tsunamis, earthquakes, drought, forest fires, oil spills and industrial accidents.
- The HKH region is a region vulnerable to disasters relating to water. This being caused by there being too much or too little water, or the water being present at the wrong place or at the wrong time.
- The function and structure of national and provincial disaster management agencies was then described, as well as their main areas of work, e.g. production of National Disaster Risk Reduction (DRR) Policy, National Disaster Management Plan, mainstreaming DRR into development.
- NDMC works more with sensitizing and raising awareness about the need to prepare for disasters, and leaves the work of flood warning and risk reduction to the FFC to deal with.
- The Federal Flood Forecasting Division of the Meteorological Office is responsible for early warning, and they provide data to NDMC who then inform the provincial and district authorities to take any necessary action.
- During the summer monsoon season, each province has a flood warning centre with staff from PMO, FFC and PDMA to monitor rainfall and the risk of floods, and to coordinate any necessary response to sudden changes in the situation.
- The 2010 Floods caused massive damage to lives and property. Some 200 million people were affected with 1985 dead and another 2946 injured in 78 districts over an area of 100,000 km². The economic cost was some USD 10 billion.
- In 2011, the monsoon floods in Balochistan Province affected some 77,500 people with 23 dead and 427 injured. In response, the government launched their largest ever relief operation costing over Rs 10 billion (approx. USD 104 million).



- Climate change is having an increasing impact in the country, such as there being:
 - Rising number of extreme climate events. In 2012, the central part of the country experienced floods (with 400mm in <24 hrs) which Balochistan is experiencing drought;

- Marked shift in monsoon rainfall zone (from NE to NW), and with intense, concentrated monsoon rains that creates heavy downpours within short time intervals;
- Inconsistent behavior of monsoon, and;
- Erratic flash flood events.
- Lesson learnt include:
 - Whilst the Board of Revenue is responsible for general land-use planning, there is a need to develop proper National Land-Use Plans to control land-uses;
 - Need for comprehensive policies and plans,
 - Institutional strengthening and capacity building of flood management related institutions
 - Efficient M&E for flood infrastructure
 - Effective disaster response force
 - Strong early warning system
 - Community based disaster risk management
- Way forward would include:
 - Developing National Land-Use Plans to control land-uses and so reduce the risk of flooding. There is also a need to have a comprehensive River Act, and to have strict codes for the design of structures;
 - Focus on DRR rather than response;
 - Institutional strengthening of DMAs;
 - Disaster education and training;
 - Disaster response force;
 - Community based DRM.

Discussions with Pakistan Meteorological Department (PMO)

- Dr. Khalid Malik (Director, PMO) began by giving a presentation entitled 'Climate Change and weather pattern in Pakistan'. He mentioned that the key objective of the PMO is to provide timely weather/flood forecasts, early warnings and advisories to the media and concerned government bodies.
- In Pakistan, most of the rain (65%) falls during the summer monsoon season from June – August, with another 25% falling in winter.
- It should be noted that Pakistan is historically prone to extreme weather events and disasters but after 1980, there has been a tendency for more extreme rain events which may be related to climate change.
- There has also been a trend for the monsoonal zone to be shifting (not expanding) more and more to the west, by approximately 100km in the last 30 years. As a result, there is now a higher frequency of more intensive rain and therefore more river discharge in the western river (i.e. Indus) as compared to that in the eastern river (i.e. Chenab and Jhelum). There is therefore a higher risk of floods in the western areas, e.g. Khyber Pukhtoonkhwa (KPK), SE Punjab and central Sindh, and these areas now require attention and support for water management and for flood mitigation.
- Impact of climate change in the region
 - Intensity of rain in the region has increased while frequency of rainy spell has decreased;
 - Decreased water availability and water quality in many arid and semi-arid regions;
 - An increased risk of floods and droughts in the regions.
 - Mortality due to diarrhoea primarily associated with floods and droughts will rise;
 - Decreases in reliability of hydropower and biomass production;
 - Increased damages and deaths caused by extreme weather events;

- Decreased agricultural crop production in South Asia could decrease by up to 30%;
- Increasing temperatures will lead to faster melting of the Himalayan glaciers which in turn, is projected to increase flooding and will affect water resources within the next two to three decades.
- Recommendations
 - Dams (large or small) should be build on priority basis to cope up climate change impacts on reservoirs;
 - Wet lands should be reassessed with respect to climate variability;
 - Needs to modify catchment areas of water reservoirs;
 - Efforts should be placed on climate change impact assessment and investments placed in communities for adaptation;
- In the discussion, it was raised that although this RAM aims to look at how wetlands could be managed for the mitigation of floods, wetlands also a key role in water storage and so mitigate against periods of drought. This role of wetlands should also be considered by the RAM.

Appendix 3: Meeting at the Water and Power Development Authority (WAPDA), WAPDA House, Lahore (Tuesday 30th October, 2012)



In attendance:

RAM Team: Inam Ullah Khan (Head, IUCN KPK Programme, IUCN – Pakistan), Zhang Chen (China Academy of Sciences), Xinqiao Zhang (Programme Officer, WWF – China), Lew Young (Sr. Regional Advisor Asia/Oceania, Ramsar Secretariat),

WAPDA: Muhammad Imtiaz Tajwer (Secretary); Shahid Hamid (Director - SMD); Muhammad Saeed (Assistant Director - Coordination); Syed Liaqat Ali (Director Administration - Sectt); Ishteqaq A. Kaokab (GM Technical Environmental Service - Environment); Ahmed Sarwar Baig (Deputy Director – Projects); Farhana Mazhar (Gender Specialist), Shahid Hamid (Small and medium dams)

Ministry of Climate Change: Umeed Khalid (Conservator Wildlife),

WWF – Pakistan: Ejaz Ahmad (Senior Director), Masood Arshad (Senior Manager); Rizwan Mahmood (Manager Disaster Response);

Summary of discussions with the Water and Power Development Agency (WAPDA)

- Umeed Khalid introduced the member of the Mission and the aims of the Mission. He explained that there Pakistan had 19 Wetlands of International Importance (Ramsar Sites) with four of these being located along the Indus River;
- Muhammad Imtiaz Tajwer said that WAPDA took a scientific approach to flood management, and knew when flood waters were about to reach a particular area. WAPDA adopts standard operating procedures (SOP) and precautionary measures well before the floods and was said by the Judicial Tribunal in their report on the 2010 floods, to have ‘done their job’ unlike some other government agencies. He further stated that the 2010 floods were a very infrequent event. WAPDA manages and maintains many of the

water bodies in Pakistan, and knows how to resolve the various water issues. They are also aware that the monsoon is slowly drifting westwards.

- Shahid Hamid mentioned that there were distinct differences in the river flow between summer, which tends to be high due to snow melt and monsoon rains, and winter when flows tends to be less. There is therefore a need for reservoirs to store water for use in winter and dams such as those at Tarbela and Mangla serve this function. In addition, another 32 new dams have been proposed with approx. eight per province. These will serve to store monsoon water for i), flood mitigation ii), provide irrigation for agriculture and iii), hydropower. In constructing such dam, EIA are always conducted and the positive and negative impacts assessed.
- Inam Ullah Khan raised the issue of how to ensure environmental flows after the construction of the dams? This is always because floods are important in flushing out the downstream wetlands and to deliver nutrient rich silt to farmland.
- He also enquired about WAPDA's approach to respond to gender issues during floods and post flood rehabilitation
- Whilst it was agreed that there needs to be an integrated approach to flood management in Pakistan involving the relevant government agencies, NGOs and well as others stakeholders, it seemed that there needs to be more ground support to make this happen.

Appendix 4: Meeting with Punjab Provincial Disaster Management Authority (PDMA), at PDMA Office, Lahore, Tuesday 30th October 2012



In attendance:

RAM Team: Inam Ullah Khan (Head, IUCN KPK Programme, IUCN – Pakistan), Zhang Chen (China Academy of Sciences), Xinqiao Zhang (Programme Officer, WWF – China), Lew Young (Sr. Regional Advisor Asia/Oceania, Ramsar Secretariat),

PDMA: Capt. (Retd) Abdul Sattar Isani (Director); Hameed Malik (Provincial Coordinator)

Ministry of Climate Change: Umeed Khalid (Conservator Wildlife),

WWF – Pakistan: Ejaz Ahmad (Senior Director), Masood Arshad (Senior Manager); Rizwan Mahmood (Manager Disaster Response);

Summary of discussions with the Punjab Provincial Disaster Management Authority (PDMA)

- After the RAM Team introduced the aims of the Mission, Capt. Isani described the work of the PDMA which was to provide mitigation, preparedness and response to disaster and calamities whether natural, man induced or accidents;
- After the 2010 floods, Pak Rs. 20,000 was provided to each of the affected families and 622000 cards had been issued;
- PDMA also mentioned that there were problems with encroachments into the floodplain areas and it was difficult to remove the people even if they knew that a flood was imminent;
- In terms of flood preparedness and coordination between government agencies during the monsoon season (June - November), the NDMA would meet every two weeks with a special advisor to the Prime Minister to review and report on the situation. In addition, a special room is set up inside the offices of the PDMA during the monsoon season with officers from the FFC, WAPDA and PMO to ensure that there is coordination and communication over any possible threat from floods and to develop responses to those threats;
- Inam Ullah Khan tried to explore if PDMA or the Provincial government had any land use zoning and planning.
- After mentioning that there were three Ramsar Sites in Punjab Province (Uchhali Complex, Chashma Barrage and Taunsa Barrage), PDMA said they would welcome cooperation with WWF to see how to improve the management of those sites so as to increase the benefits that those sites provided for the

people living there. There could be opportunities for restoration of the wetlands so as to provide more food (e.g. fish) for local communities and so improve their livelihood. PDMA would welcome further discussions with WWF on this as they can help to develop livelihood initiatives.

Appendix 5: Meeting with Punjab Provincial Wildlife and Forestry Department, at Poonch House, Lahore, Wednesday 31st October 2012



In attendance:

RAM Team: Inam Ullah Khan (Head, IUCN KPK Programme, IUCN – Pakistan), Zhang Chen (China Academy of Sciences), Xinqiao Zhang (Programme Officer, WWF – China), Lew Young (Sr. Regional Advisor Asia/Oceania, Ramsar Secretariat),

Punjab FWD: Iftikhar Hussain Shah (Director General), Shahid R. Awan (Deputy Secretary - Planning), Muhammad Anwar Malik (Assistant Director - Planning), Muhammad Naeem Bhatti (Deputy Director - Head Quarter);

Ministry of Climate Change: Umeed Khalid (Conservator Wildlife);

WWF – Pakistan: Masood Arshad (Senior Manager); Rizwan Mahmood (Manager Disaster Response);

Summary of discussions with the Punjab Provincial Forestry Department

- Regarding the Chashma and Taunsa Barrages, both are wildlife sanctuaries, supporting many important species including Marbled Teal *Marmaronetta angustirostris*, Lesser Whistling Duck *Dendrocygna javanica* and Indus River Dolphin *Platanista minor*. The island by Taunsa Barrage supports a population of Hog Deer *Hyelaphus porcinus*. Smooth-coated Otters *Lutrogale perspicillata* occur at Taunsa Barrage but are often killed by local when they are found because presumably, they are thought to be competing with the fishermen for fish;
- Chashma Barrage is under the responsibility of WAPDA whilst Taunsa Barrage is under the responsibility of the Irrigation Department;
- The wildlife mainly use the ponds on either side of the Indus River close to the barrages. The ponds are owned by the Irrigation Department and they used to issue temporary leases to the local people to use

the ponds for agriculture. Two years ago after the 2001 floods, the people who had illegally settled into the area were removed, and management of the ponds were transferred to the Punjab Provincial Forest and Wildlife Department.

- At Chashma Barrage, the Punjab FWD is working closely with WAPDA over the management of the ponds whilst at Taunsa Barrage, Punjab FWD cooperates with the Irrigation Department;
- However, Irrigation Department can place restrictions on the management activities at the ponds, including forbidding the construction of further structures and settlements, when to drain or flood the ponds etc. A total of 11 sites were handed over to the PPFWD;
- Despite the restriction on illegal use of the area, influential people are returning to the pond areas and encroaching into them;
- In 2011, WWF and the Punjab FWD constructed 8 mud check post at Taunsa Barrage and hired 14-15 guards with motorbikes (funded by WWF) to stop encroachment into the area. An education centre at the site has been opened and WWF are now carrying out a number of projects at the site involving the local community. The site is a popular destination for visitors and students from surrounding areas, such as Multan.
- Fishing is an important activity at all three of the Ramsar Sites in Punjab. At Chashma Barrage, the Fisheries Department has established stations and the pond areas are filled during floods for fish harvesting.
- In Punjab province, a well managed system of fishing seemed to have been established along the Indus River. Fishing rights are given to contractors who are then responsible for fishing along certain stretches of the river. The contractor also ensures the proper management of the fishing and is responsible for any offenses that they or their workers may commit. The Punjab Fisheries Department will control the season when fishing can be conducted as well as the size of the fish that can be harvested.
- In Sindh Province however, there is a permit system and individual can obtain a permit in the form of fishing cards for a relatively small amount (say Rs 50), which leads to many people trying to take fish from the river in an unmanaged way, e.g. poisoning.
- The conservation of flooded forests is another issue along the Indus River. Large area have already been lost or affected through encroachment by people creating farmland, or they are in a poor condition because of a lack of water due to the construction of upstream dams/barrages restricting flow. Around 20-30 years ago, the water table was about 30 feet down but now, it is decreased to about 200 feet. Due to changes in the course of the Indus River, some of the flooded forests are far inland, up to 3-4 km. Some 18,000ha now remain and are in need of urgent protection. The Punjab FWD are trying to restore certain areas and have re-seeded around 7,500ha of land where the trees are now growing. In future,
- The Punjab FWD suggested that in future, new channel should be provided to deliver water to the areas of flooded forests.
- Punjab Province has a Wetland Policy which considers the management of both Chashma and Taunsa Barrages. The Ramsar Information Sheets (RIS) for all the Ramsar Sites in Punjab require updating since the current RIS that the Secretariat hold are from 1996, and these RIS are supposed to be updated every six years;
- The Punjab FWD were honest and said that designation of the wetlands in the province as Ramsar Sites has not provided much benefit to the sites so far. Funding support for the sites is required.

Appendix 6: Meeting with Punjab Provincial Irrigation Department, at Canal Bank, Lahore, Wednesday 31st October 2012



In attendance:

RAM Team: Inam Ullah Khan (Head, IUCN KPK Programme, IUCN – Pakistan), Zhang Chen (China Academy of Sciences), Xinqiao Zhang (Programme Officer, WWF – China), Lew Young (Sr. Regional Advisor Asia/Oceania, Ramsar Secretariat);

PPID: Nazir Ahmad Anjum (Chief Engineer, Drainage & Floods), Safdar Ali Zafar (Director Floods);

Ministry of Climate Change: Umeed Khalid (Conservator Wildlife);

WWF – Pakistan: Masood Arshad (Senior Manager); Rizwan Mahmood (Manager Disaster Response);

Summary of discussions with the Punjab Provincial Irrigation Department:

- Nazir Ahmad Anjum explained that there were 13 barrages in Punjab Province along the Indus and that these were for diverting water to irrigate farmland;
- He stated that the ponds (2300 acres) at Taunsa Barrage were to provide water to feed off-take canals for irrigation purposes and that confirmed that management of these ponds had been handed over to the Punjab Province Forest and Wildlife Department. He stressed that there should be hindrance to the flow caused by the subsequent management of the ponds by the PPFWD;
- The ponds at Taunsa barrage have a size of 2 to 4 acres each. Wheat and cotton are grown in these ponds and rice is grown during the monsoon season;
- During the 2010 floods, there was no damage to the Taunsa Barrage or the bunds. However, the Irrigation Department is considering allowing a man-made breach on the right-side of the river under the railway bridge in future if the floods waters are high. This would have the effect of allowing the flood water to enter an area of floodplain but the only problem is that the affected site is on private land and the government would have to compensate the owner for their land being flooded in emergencies.
- The Irrigation Department is considering increasing the height and width of the existing bunds at Taunsa.

- In March 2012, the Punjab Irrigation Department issued a 'Flood Fighting Plan' in view of the upcoming monsoon season. The Plan mainly focuses on the southern districts of the province that were affected by the floods in 2010;

Discussions with WWF Pakistan:

- The ponds at Taunsa Barrage are deeper than that of the Indus but between 2005 – 2010 they were illegally levelled by local farmers backed by influential people. Levelling of the pond areas for agriculture has resulted in the elimination of natural depressions making the ponds more shallow hence resulting reducing the natural storage capacity. These ponds are now abandoned after the 2010 floods.
- There are five ponds at Chashma Barrage which are managed by WAPDA. As WAPDA is 'stronger', they are able to control illegal encroachment as compared with the situation at Taunsa Barrage.
- The main species of plants in the riverine forests are *Acacia nilotica*, *Prosopis spicigera*, *Prosopis juliflora*, *Prosopis glandulosa*, *Tamarix dioica*, *Desmestachya bipinnata* and *Calotropis Procera*. Of these, *Acacia nilotica* is said to be the most valuable species and is also dominant. It is succeeded by *Prosopis spicigera* in the ecology of riverine vegetation (<http://www.sindhforests.gov.pk/resources.html>)

**Appendix 7: Meeting with Stakeholders at Lal Suhanra National Park,
Bahawalpur, Thursday 1st November 2012**



In attendance:

RAM Team: Inam Ullah Khan (Head, IUCN KPK Programme, IUCN – Pakistan), Zhang Chen (China Academy of Sciences), Xinqiao Zhang (Programme Officer, WWF – China), Lew Young (Sr. Regional Advisor Asia/Oceania, Ramsar Secretariat);

Punjab Forest Department: Saadat Ali Khan (Conservator Forests, Administrator Lal Suhanra National Park); Fida Hussain; Muhammad Shahid Arbi (Stenographer); Muhammad Zafar (Accountant); Fazal ur Rehman

Punjab Fisheries Department: Muhammad Arif Chughtai (Deputy Director Fisheries, Bahawalpur);

Punjab Irrigation Department: Muhammad Naeem (Executive Engineer); Muhammad Zafar Iqbal (Chief Engineer)

Ministry of Climate Change: Umeed Khalid (Conservator Wildlife);

WWF – Pakistan: Masood Arshad (Senior Manager); Rizwan Mahmood (Manager Disaster Response); Mubashar Azam Rana (Coordinator, TREC);

Summary of discussions with Stakeholders at Lal Suhanra National Park:

- Lal Sohanra was originally the hunting ground of the Nawab of Bahawalpur and in 1968 was declared a game reserve. In 1972, it was declared a national park and then a Biosphere Reserve in 1977. The site is situated in the north-western edge of the Cholistan Desert in Bahawalpur district, Punjab Province;
- The site is very popular with visitors and some 100,000 people came during the last Eid-holidays. These visitors come from as far as 150km away. The CM of Punjab has declared that there would be no charge for entrance;
- The land at Lal Suhnara was established by a previous Nawab of Bahawalpur who recognized the risk of less and less water flowing from the Sutlej River in India to Bahawalpur for drinking and irrigation purposes. As a result, he developed three large ponds for storing water in time of reduced flow. However, the ponds slowly silted up and as the flow declined, the Forest Department started using the fertile ponds for irrigated plantation (1/3 of the area) and kept the remaining area (2/3 with natural vegetation);
- LSNP receives its water from the Desert Branch canal and originally, the ponds in LSNP were well supplied and the third pond covering 4,780 acres (1934ha) was good for fisheries and other wildlife. The revenue from the sale of the fish would go to the Forestry Department.

- The amount of water promised to be given as donation to the park has not been ensured and diminished with the passage of time, thus resulted in degradation of habitat.
- However, the amount of water received by the site has been declining. One reason is that Tarbela Dam has been reducing the amount of water that it is providing to all the canals that depends upon it and as a result, there is now not enough water to supply the third ponds in LSNP (by about 60cm). This problem is exacerbated by a decline in rainfall and from May – July 2012, there was a severe drought in the region. There are currently no plans on how to deal with future droughts and there are no plans for using the third pond as a reservoir for storing excess water for use in times of drought.
- The LSNP could pay the Irrigation Department for the water to fill this third pond but the cost would be some millions of Rupees annually. The last bill was at a cost of some 3.7 million Rupees. Instead, the Irrigation Department has said that they can provide the LSNP with surplus water for free. However, the question is not whether the LSNP have the money to pay for the water but whether the Irrigation Department has the water to supply LSNP.
- The priority of the Irrigation Department is to provide water for irrigation and not for the third pond at LSNP. Farmers wanting water for irrigation have to pay but the amount is not high.
- The Irrigation Department said that they do not irrigate new farmland but only old ones. However, the third pond at LSNP has been there for many decades already and so providing water to the pond cannot be considered as supplying water to a new area.
- One option for the management of the third pond is for the Forestry Department to lease fishing rights out for the pond to private contractors, and the Irrigation Department then provide water to the site as it will then be for aquaculture. This would then be a win-win situation for the Forestry Department and the local people. The recent Punjab Provincial Forest Act allows for taking a PPP approach to managing forest lands. The floor of the pond could also be re-profiled to create areas of shallow and deep water so that there will also be some areas of water and refuge for fish;
- Poaching is still a problem in the third pond and if not controlled, there would be no wildlife left.
- When Mr. Nawaz Sharif was Prime Minister of Pakistan, he liked LSNP very much and often used to come and stay over. As his family established the Ittefaq Group of Industries which is a major steel producer in the country, he may be interesting in supporting the conservation work at the site;
- In the discussion with the Pakistan Meteorological Office in Islamabad, there was no discussion about how the pattern and severity of drought is changing in Pakistan. Is there also a need for a Drought Disaster Management Plan?

Appendix 8: Meeting with Stakeholders at Guddu Barrage, Friday 2nd November 2012



In attendance:

RAM Team: Inam Ullah Khan (Head, IUCN KPK Programme, IUCN – Pakistan), Zhang Chen (China Academy of Sciences), Xinqiao Zhang (Programme Officer, WWF – China), Lew Young (Sr. Regional Advisor Asia/Oceania, Ramsar Secretariat);

Sindh Wildlife Department: Ghulam Muhammad Gadani (Deputy Conservator Wildlife), Hyder Raza Khan

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WWF – Pakistan: Masood Arshad (Senior Manager); Rizwan Mahmood (Manager Disaster Response); Mubashar Azam Rana (Coordinator, TREC);

Summary of discussions with Stakeholders at Guddu Barrage:

- There are 19 barrages in the Indus River system with three in Sindh province, at Guddu, Sukkur and Kotri;
- The Indus River System Authority (IRSA) lies within the Ministry of Water and Power and was created in 1992. It works to implement the Water Apportionment Accord (1991) by forecasting water availability each year and then dividing the available waters of the Indus River to each of the provinces and to smooth any disputes. The IRSA is made up of five members, one from each province and one from the Federal Government. The Chair is selected on a rotational basis from the members. There are also technical committees to provide advice to the IRSA;
- The IRSA can revise the proportion of water apportioned to each province after consultation with the Provincial Irrigation Departments. Usually, Punjab receives most of the water, followed by Sindh, then Khyber Pakhtunkhwa and finally Balochistan;
- There does not appear to be a coordinating body with responsibility for the overall management of the Indus River and its waters. Instead, there are a number of agencies each with their own role such as:
 - The IRSA;
 - Provincial Irrigation Department;
 - Federal Flood Commission;
 - National, and Provincial Disaster Management Authority;
 - Environmental Protection Agency;

- Provincial Fisheries Department;

- In fact, the 1973 Constitution gave responsibility to the provinces for issues such as biodiversity, forestry and fisheries, and it even gave them powers to enact their own provincial legislation and regulation on these issues, rather than rely on the Federal Government. In July 2011, further powers were given from the federal government to the provinces - 'devolution';
- In the case of international agreements such as the Ramsar Convention, the provincial government are responsible for implementing the Convention at the site level, under the coordination of the Federal Government. Since 2011, there has been further devolution of power from the federal to the provincial level;
- A consultancy study was conducted in 2004/05 to look at the issue of environmental flows in the Indus River and proposed that 10 million acre feet be allowed to flow annually to the Indus River Delta but this was not approved by government and instead, an amount of 8.5 million acre feet was endorsed instead;

Hill torrents

- *Alamgir (FFC)*: said that there need to be more water storage capacity to deal with future floods. Hill torrents were an issue in flood control and he suggested that secondary and tertiary rivers should be managed for floods from hill torrents. In the Dera Ghazi Khan (DG Khan) and Dera Ismail Khan (DI Khan) regions, there are opportunities to use natural floodplains to control hill torrents. There are also opportunities to construct small dams, such as the multi-purpose Gomal Zam Dam (completed in 2011) where the waters can be used for irrigation, flood storage, wetland conservation etc. Regarding the mainstream of the Indus River, he added that the encroachment that were present on either side of the river downstream of Chashma Barrage needed to be removed in order to allow less impediment to flood flow along this stretch of the river;

Wildlife along the Indus River

- *Ghulam Muhammad Gadani (Sindh Wildlife Department)*: reported that in a 2011 survey, 980 Indus River Dolphins in 22 groups were recorded between Guddu and Sukkur Barrages. There has been an increasing trend in numbers since the first survey in 2001, and then repeated surveys every 5-years. Conducting such surveys is expensive, with some Rp 200 million required each time,
- Regarding the barrages as obstruction to the movement of the dolphins, there is talk of constructing dolphin corridors through the barrages but nothing has been done yet. There are however fish ladders but they are not functioning. There is a famous fish in the Indus called 'palo' and due to the barrages blocking their migration along the Indus, their population has declined;
- Riverine forests are unique for the area and there are some 120,000 acres on the left bank and 200,000 acres on the right bank between Guddu and Sakkur. Such forests can provide multiple benefits. For example, those forests which have been designated as Reserved Forests are used by local people for timber, thatching etc. They can also play a role in flood storage.
- The area of such forests has been disturbed over the past decades due to the presence of the barrages. During the 2010 floods, the water level stayed usually high for >25 days which killed many of the young trees;

Fishing

- It was remarked that few boats, including fishing boats could be seen in the Indus River. This was said to be due to the monsoon season when the flood waters make fishing difficult. The fishermen are supposed to return in winter when the flow decreases. In 1991, the law and order situation in the region was bad and so at that time, many fishermen left the area as well;
- In recent years, Sindh has moved from a system of fishing by contract to a few fishermen who would manage and be responsible for a stretch of river, to one with licenses to many more people who can fish where they like. The result is that there is now much less control of fishing and fishermen are often using illegal methods to catch as many fish as they can, e.g. by using poison. In 2011, some 50 dolphins were found dead as their carcasses are usually found washed up by the lower barrage gates and are reported by local people. The Wildlife Department would like to carry out autopsies on the carcasses but do not have the equipment nor the expertise;

Obstructions to flow

- People have been living in the floodplains before the time when the barrages were built and they are used to floods which lasts 13-15 days. The population of these people has increased and it is difficult to remove them because of the floods due to the support they receive from politicians who depend upon these people for their votes.
- There are also problems with structures hindering the flow of flood water. These include illegal private bunds and even bridges that constrict the flow of the river. One such bridge is that spanning Larkana-Khairpur which was mentioned in the Judicial Tribunal's report as one of the causes of blockage of flood water.

Breach at Tori Bund

- In Sindh, there are usually two lines of flood defences (bunds) alongside the Indus River and the distance between these bunds is not set;
- Due to the topography of the land when it floods in Punjab Province, the water will flow back to the Indus but in Sindh, the water tends to stay on the flooded land;
- The Tori Bund is one of the lines of defence on the right side of the Indus River between Guddu and Sukkur Barrages and its breach in 2010, was one of the causes of the terrible damage from the severe floods that monsoon season. Apparently since 1947, the Tori Bund has been breached some 21 times in different years. The breach in the bund has now been repaired and the bund strengthened with a section that is ;
- Irrigation Department staff reported that they need a metalled road on top of the bunds so that during floods, their staff can travel quickly to sections of the bunds and carry out any urgent repair that is needed. He said that the local staff of the Department's can control the flood waters but the main problem is that the ID needs to have the power they once had, to control illegal structures, disturbances\breakage of the bunds etc. There are law and order issues at the sites with the local people and there needs to be cooperation between the Forest Department, Irrigation Department etc to control illegal activities as before;
- In this area, the floods had relatively little impact on peoples' lives because there exists a good early warning system so that the people could escape before floods occurred. Problem is mainly with the hill torrents (see above);

- When the land outside the bunds are leased to the influential landowners for farming, they are supposed to plant flooded forests on 25% of the land and to farm on the remaining 75%. The forests are idealz meant to be planted parallel to the bunds to serve as some kind of protection against floods but this is not happening;

Appendix 9: Meeting with Stakeholders at Dolphin Information Centre, Sukkur Barrage, Saturday 3rd November 2012



In attendance:

RAM Team: Inam Ullah Khan (Head, IUCN KPK Programme, IUCN – Pakistan), Zhang Chen (China Academy of Sciences), Xinqiao Zhang (Programme Officer, WWF – China), Lew Young (Sr. Regional Advisor Asia/Oceania, Ramsar Secretariat),

Federal Flood Commission: Alamgir Khan (Chief Engineer, Floods)

Ministry of Climate Change: Abdul Munaf Qaimkhani (Deputy Inspector General Forests), Umeed Khalid (Conservator Wildlife),

Sindh Fisheries Department: Manzoor Ahmed Soomro (Assistant Director Fisheries), Ghulam Mustafa Gopang (Deputy Director Fisheries),

Sindh Forest Department: Rafique Ahmed Malik, Aisha Channa (S.O.), Maqsood Ahmed, Javed Ahmed Mahar

Sindh Wildlife Department: Hussain Bux Bhagat (Chief Conservator Wildlife), Ghulam Muhammad Gadani (Deputy Conservator Wildlife)

WWF – Pakistan: Dr. Masood Arshad (Senior Manager), Rizwan Mahmood (Manager Disaster Response)

Summary of discussions with Stakeholders at Dolphin Information Centre:

Indus River Dolphins

- The first survey for the Indus River Dolphin in 1972 recorded 387 individuals from Guddur to Sukkur. Then more recently in 2011, 918 were recorded from the same stretch of river, with another 29 from Sukkur to Kotri. Surveys are conducted every 5 years;
- Between 1995 and 2012, the Sindh Wildlife Department (SWD) and WWF rescued 71 dolphins but another 83 were found dead, washed up by Sukkur Barrage. The SWD would like to have the capacity to conduct autopsies on the carcasses of the dead dolphins to find out the cause of death;

- There was a sudden increase in the number of dolphins found dead in 2011 (45 individuals), and a further 15 individuals from Jan – May 2012 alone. This is blamed on the new system of issuing permits to the local community to fish in the Indus River;
- The Indus Dolphin Reserve is not zoned into one area for conservation and another for fisheries because the dolphins move from one area to another. However, fishing is not prohibited close to the barrages;
- Other wildlife in the Ramsar Site include Hog Deer, wild boar, and Grey and Black Partridges;
- WWF Pakistan has drawn up a management plan for the Ramsar Site.

Fisheries

- The Fisheries Department explained that there used to be a contract system to control fishing in the Indus River but the system has been changed to that of a license system now to try and benefit the poorer section of the community;
- There are now some 2,000 to 4,000 fishermen who are charged a nominal rate of some 100-150 Rp per year for the license with no limit on the catch. As a result, fishermen try to get as much fish as they can. AS the system is poorly controlled, some fishermen resort to using poison which may also kill the dolphins. If offenders are caught, then they are only fined a small fee;
- The city of Sukkur use water from the river for household use so if people are using poison to fish, then it will affect peoples' health as well;
- The Fisheries Department also encourage pond fish farming. Some of the ponds belong to the government and others are privately owned. Fish in the pond include Chinese and Indian Carps, Silver Carp, Grass Carp, and Bighead.
- There appears to be some dispute over the granting of land to people for fish culture as the Forestry Department also licenses out land from their forest land for fish culture. There is a need for clearer mapping of the land to clarify that which is under the responsibility of different government departments, and that is owned either by the government or privately;

Flooded forests

- Flooded forests grow in narrow belts along the banks of Indus River and its tributaries. They are more commonly found in Sindh and to some extent in the Punjab. The common species are Babul *Acacia nilotica*, Shisham *Dalbergia sissoo* and *Tamarax dioica*. Other species include Khejri *Prosopis cineraria* and *Populus euphratica* are some other species;
- The Forest Department has a programme to restore the flooded forests. The seeds of the *Acacia nilotica* need to pass through the stomach of animals before they can germinate well. As a result the seeds are first fed to goats before being recovered in the faeces. Then as the flood waters begin to recedes (June to August), the seeds are sown directly into the shallow water. After the water waters have receded completely and the ground is exposed, then the young regenerating trees can be seen;
- When the trees are 6-7 years old, the forest can be thinned and some cut to be sold for making pit props (e.g. in Balochistan). When the crop reaches 16-17 years, then it is mature enough to be sold, mainly for lumber;
- Challenges faced by flooded forests include the fact that the land on which many of the forest is growing is becoming dry due to reduced river flow. There are also problems with laws and order, with illegal cutting of the trees for timber and firewood, and to free up land for grazing and other uses;
- The 2010 flood damaged the 3 year old crop of trees since the trees were submerged for >25 days;

- Suggested steps to be taken include:
 - Enforcement of legislation;
 - Establish new Forest Courts to deal with forestry offences since existing courts cannot deal effectively with cases quickly and efficiently;
 - Re-connect the forest and water sources to establish the normal flooding regime;
- A Sindh Wildlife Act is in the process of being approved and which should be able to resolve these problems;
- The Irrigation Department has an operation manual for embankments which used to state that trees should be planted within 500m alongside the base of the embankments to protect them during times of flood. However, this is under the responsibility of the Irrigation Department and not the Forestry Department;
- The person holding the lease to the land by the side of the embankment should be responsible for planting the trees but this is not being done and the rule is not being enforced. The lack of interest in planting is despite there being incentives such as the owner can receive 50% of the profits from the sale of the timber but people are not interested in long-term profits, and so use the land for agriculture instead, e.g. wheat.

Embankments

- The Tori Bund has been breached before. Near to the breach site along the bund used to be a lake (Rup Lake?) that was used for fisheries. However, the lake is now silted up with mud that was brought in from each breach of the bund. It could be possible to restore the lake and use it for storage of flood waters and to benefit the local communities.

Environmental flows

- The SWD complained that more water should be retained in the Indus River and allowed to flow to the delta to save the mangrove forests. Upstream barrages are taking most of the freshwater and the government now have plans to build more small dams in the tributaries of the Indus to hold monsoon rains.

Appendix 10: De-briefing Session with Stakeholders at Hotel Sunfort, Lahore,
Monday 5th November 2012



In attendance:

RAM Team: Inam Ullah Khan (Head, IUCN KPK Programme, IUCN – Pakistan), Zhang Chen (China Academy of Sciences), Lew Young (Sr. Regional Advisor Asia/Oceania, Ramsar Secretariat),

Federal Flood Commission: Alamgir Khan (Chief Engineer, Floods)

Punjab Irrigation Department: Nazir Ahmad Anjum (Chief Engineer, Drainage & Floods), Safdar Ali Zafar (Director Floods)

Punjab Wildlife Department: Iftikhar Hussain Shah (Director General), Muhammad Naeem Bhatti (Deputy Director - Head Quarter), Muhammad Anwar Malik (Assistant Director - Planning)

Ministry of Climate Change: Syed Masood Nasir (Inspector General Forests), Umeed Khalid (Conservator Wildlife),

National Disaster Management Authority: Syed Sibte-e-Abbas Zaidi (Director)

Pakistan Metrological Department: Khalid Malik (Director)

Sindh Wildlife Department: Mushtaq Ali Memon (Secretary)

WAPDA: Mushtaq Ahmad (Chief Engineer), Rana A. Dastgir (Additional Deputy Director), Ishteqaq A. Kaokab (Director - Environment), Ahmad Ameen

WWF – Pakistan: Ali Hassan Habib (Director General), Ali Hasnain Syed (Manager Freshwater Policy), Dr. Masood Arshad (Senior Manager), Rizwan Mahmood (Manager Disaster Response), Najam ul Huda Khan (Manager Capacity Building), M. Jamshad I. Chaudhry (Research Officer),

Media: Nisar Ahmed Sani (Coordinator - Punjab PDMA), Rafi Jamal (Programmer - Sama TV), Malik Arshad Asim (Waqat News)

Summary of de-briefing session with stakeholders:

After the presentation from the RAM Team on the preliminary results of the mission, participants at the de-briefing session were then invited to provide comments or to ask question. These comments included that:

- Before new techniques are suggested for flood control, there should be documentation of the traditional knowledge on flood management/use to see if those techniques are still appropriate now;

- The restoration of flooded forests should be considered as part of the programme to restore the floodplains along the Indus River for flood control;
- The final report should consider the economic valuation of natural floodplains and the provision of alternative livelihood for local people as part of any recommendations;
- When the RAM Team suggested that some of the areas of restored wetlands could be used for fisheries, it should be remembered that the people along the Indus do not have a tradition of aquaculture and so any recommendations need to be adapted to suite the local situation;
- It was suggested that any revenue from the use of the Indus River and the floodplains should be used for the conservation of the site;
- The report of the IPCC 4th Assessment Report should be considered, especially the impacts from the excessive melting of the glaciers which would reduce the amount of snow melt in the Indus and thus affecting the total amount of flow in the river.
- The westward movement of the monsoon rains by 50 – 80km as monitored by the PMO should be considered in the report;
- Capacity building opportunities should be provided to the younger officers on the importance of floodplains. Materials on this subject should also be provided for communication purposes to key stakeholders (e.g. land-owners, religious leaders, media etc.);
- A National Water Policy for Pakistan is being prepared and that would be an opportunity for including the concept of IRBM;
- There was some discussion about where funds could be made available to implement the recommendations from the RAM report with some suggesting opportunities such as receiving support from the 'Climate Change Adaptation Fund'. However, there were some arguments that 'we should first go into a learning phase via a pilot project rather than enter straight into a multi-million dollars project';
- Other issues the RAM report should consider are: pollution in the Indus River, more efficient irrigation methods, price differentials for water, rescue of wildlife during floods;
- A working group should be established to follow up on the recommendations in the report from the RAM;

Appendix 10: De-briefing Session with Stakeholders at Hotel Sunfort, Lahore,
Monday 5th November 2012

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