



**Investigating**  
**mass scale mortality**  
**of Freshwater Turtles**

downstream Sukkur Barrage, Indus River - Sindh

April - 2010



The Ministry of Environment's Pakistan Wetlands Programme

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**April, 2010**

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# Investigating mass scale mortality of freshwater turtles downstream Sukkur Barrage, Indus River – Sindh

March 28<sup>th</sup> – April 01, 2010

**Executive Summary:** A five day long (March 27<sup>th</sup> - April 01<sup>st</sup>, 2010) field investigation was undertaken to identify the causes of mass scale mortality of freshwater turtles downstream Sukkur Barrage. Hundreds of freshwater turtles were found dead on the banks of the River Indus as a result of chemical poisoning of water on March 24<sup>th</sup>, 2010. The Pakistan Wetlands Programme field investigation team visited the site, collected soil, water and tissue samples and met with the provincial line departments including the Environment Protection Agency, Wildlife, Forest and Fisheries Department and the representative of the IUCN-Pakistan. In addition, several interviews were carried out on the site with local fishermen and the representatives of the Pakistan Fisherfolk Forum. The purpose of the field observations, meetings and interviews were to find out causes and solutions to the problem. The team recommended holding dialogues at the federal level with the potential stakeholders, declaring the freshwater turtles as protected animals in Sindh Province, monitoring turtle capture and trade at the community level, launching a media awareness campaign to highlight the role of turtles in the freshwater ecosystem.

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**1. Background:** Pakistan's aquatic ecosystems provide habitat for eight species of freshwater turtles. These include *Chitra indica*, (EN; Appendix II) *Nilssonina gangetica* (VU; Appendix I), *Nilssonina hurum* (VU; Appendix I), *Lissemys punctata andersoni* (LR/LC; Appendix II), *Pangshura tecta* (LR/LC; Appendix I), *Pangshura smithi* (LR/NT; Appendix II), *Hardella thurji* (VU), and *Geoclemys hamiltoni* (VU; Appendix I). These species are found in the Indus River system; in rivers, canals, ponds, lakes and agricultural fields. Freshwater turtles being omnivorous constitute important component of the aquatic ecosystems by maintaining populations of other aquatic flora and fauna. Turtles clean the water resources and maintain the functional integrity of ecosystems by scavenging on the dead organic waste material.

Turtles, all over the world are facing high extinction rates due to habitat degradation and fragmentation, water pollution, unsustainable development and scarcity of water. In addition, turtles serve as an important component of the commercial food industry in many South-east Asian countries. Turtle are believed to contain aphrodisiac properties and are also used in the traditional Chinese medicines. The increase in demand for these species has already declined the local populations of turtles in the host countries. The harvesting pressure has now been shifted towards the neighbouring countries to fulfil food market requirements and threatened the likely existence of endemic populations of these precious species.

Pakistan observed the illicit trade of turtles on commercial level in 2007 when the Ministry of Environments' Pakistan Wetlands Programme (PWP) revealed the facts about this illegal practice through extensive surveys along the Indus River. Export of turtle body parts is a violation of Pakistan's international obligations under the Convention on International Trade in

Endangered Species of Fauna and Flora (CITES). A complex network of turtle dealers at local and national level was found to exist and operate actively with the help of native impoverished communities. These local communities have been involved by providing them with financial benefits and introducing this practice as a lucrative business among them.

The PWP appraised this issue with the concerned line departments to protect freshwater turtles and ultimately conserve the biodiversity of the country. Provincial Wildlife Protection Acts in two provinces (NWFP and Punjab) have been amended to designate turtles as protected animals by enlisting them in the highly protected category. Consequently, many consignments of freshwater turtle parts have been confiscated both locally and at the international exit ports. In Sindh province, freshwater turtles are yet to be declared as protected animals.

**2. The Problem:** Taking the advantage of weak legislative measures, people have reported to harvest turtles by using unethical means. Such a calamity happened in downstream Sukkur Barrage on March 24<sup>th</sup>, 2010, where freshwater turtles were harvested using toxic chemicals in the Indus River in order to maximise catch of freshwater fish and turtles. This catastrophe occurred when the downstream water flow was at its minimum and the Barrage gates were closed. The left over downstream water was available in the form of large pools, which presented an ideal opportunity to the culprits to practice this illegal activity. The news spread to the entire conservation community on 25<sup>th</sup> March, 2010 and several news articles were written in newspapers and *AAJ News* crew visited the site and presented live coverage to the Pakistanis.

**3. Objectives:** In order to investigate the issue, a six-member team comprising of representatives of Pakistan Wetlands Programme (PWP) and a local representative of the WWF-Pakistan Office based at Sukkur embarked on the survey. The team members had a diverse educational background with substantial field experience in the field of wetlands conservation and management. The field investigation team set out the following specific objectives in order to find out the problem and to suggest recommendations for future course of action.

The specific objectives were to:

1. Undertake comprehensive field investigations to identify causes for mass scale mortality of freshwater biodiversity especially turtles, downstream Sukkur Barrage, Sindh.
2. Conduct meetings and interviews with respective government and non-governmental organisations regarding actions taken by these agencies and lobbying for future conservation of freshwater biodiversity in general and turtles in particular.
3. Devise a strategy in order to recommend an immediate plan of action to control the use of chemicals resulting in the loss of mass scale freshwater biodiversity especially turtle and subsequent trade in their parts.

#### **4. Field Work Programme**

The following six member field team (Table 1) participated in the initial field investigation, which was carried out at downstream Sukkur Barrage.

**Table 1:** Names of the participants of the field investigation team

| S.# | Name                                | Designation                               | Organisation           |
|-----|-------------------------------------|---|------------------------|
| 1   | Masood Arshad                       | Manager, National Programme               | WWF – Pakistan / PWP   |
| 2   | Col. (Retd.) Sheikh Muhammad Waseem | Coordinator, TREC                         | WWF – Pakistan / PWP   |
| 3   | Uzma Noureen                        | Wetlands Biologist                        | WWF – Pakistan / PWP   |
| 4   | Zafar Ali                           | In-charge, Central Indus Wetlands Complex | WWF – Pakistan / PWP   |
| 5   | Liaqat Ali Khokhar                  | Assistant Project Officer                 | WWF – Pakistan / IRDCP |
| 6   | William Kanwal                      | Driver                                    | WWF – Pakistan / PWP   |

The team conducted a five-days survey (March 28<sup>th</sup> – April 1<sup>st</sup>) of the Sukkur Barrage. The detailed itinerary was planned and mentioned in Table 2. During the survey, field observations, interviews and meetings with concerned departments were organised.

**Table 2:** Detailed travel itinerary for investigation of mass scale freshwater turtle mortality

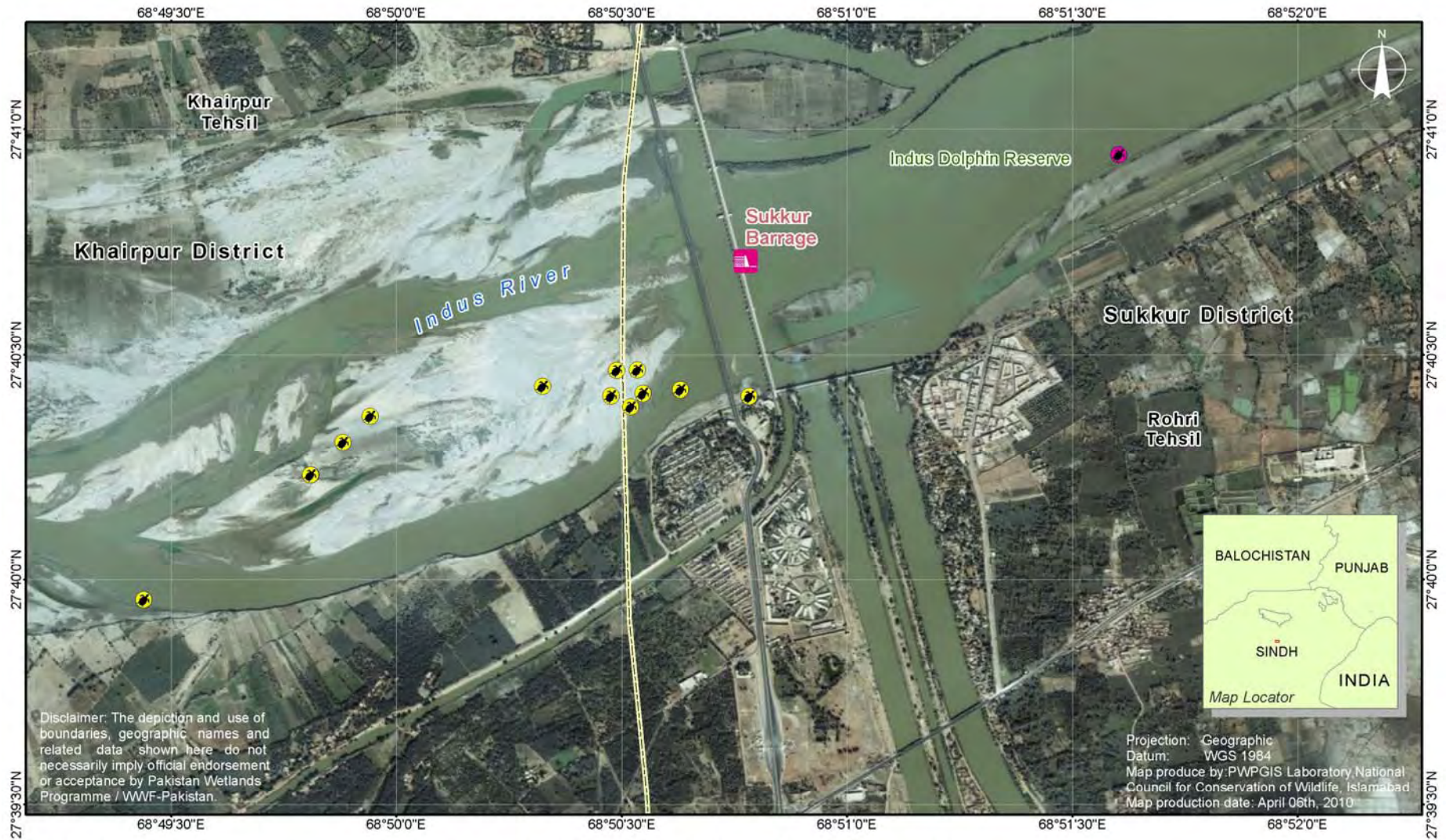
| # | Date       | Activities   |
|---|------------|--|
| 1 | 27.03.2010 | 1. Arrival at Lahore   |
| 2 | 28.03.2010 | 1. Departure to Sukkur: 2. Arrival at Sukkur   |
| 3 | 29.03.2010 | 1. Field Observations. <ul style="list-style-type: none"> <li>– Visit downstream Sukkur (6-7 kilometres)</li> <li>– Collection of samples (Soil, Water, Specimen, Tissues)</li> </ul> 2. Local fishermen interviews (On site)<br>3. Meeting with Director Fisheries (On site)  |
| 4 | 30.03.2010 | 1. Field Observations.<br>2. Meetings with provincial departments: <ul style="list-style-type: none"> <li>– Sindh Environment Protection Agency (EPA)</li> <li>– Sindh Wildlife Department</li> <li>– Sindh Fisheries Department</li> <li>– Sindh Forest Department</li> </ul> 3. Pakistan Fisherfolk Forum (PFF)<br>4. Field Observations at Barrage Gates - Upstream |
| 5 | 31.03.2010 | 1. Field Observations <ul style="list-style-type: none"> <li>– Visit upstream Sukkur</li> <li>– Collection of samples (Soil, Water, Specimen, Tissues)</li> <li>– Local fishermen interviews (On site)</li> </ul> 2. Meeting with representative of IUCN-Pakistan<br>3. Final brief discussion with Sindh Wildlife Department  |
| 6 | 01.04.2010 | 1. Departure to Lahore: 2. Arrival at Lahore   |

## 5. Methods of field investigation

### 5.1.1. Study site

Upstream Sukkur Barrage has been designated as Ramsar Site, which contains highly dense population of Endangered Indus Blind Dolphin *Platanista minor* (locally known as *Bhulan*). This species is endemic to Pakistan and is facing severe threats due to stranding in canals, as a by-catch in fishing nets, pollution (pesticides, industrial effluents and sewerage) and due to lack of freshwater because of an increased demand to construct more dams. This site is also home to Endangered Hog Deer *Axis porcinus*, soft and hard-shell turtles and several species of fish as well. Migratory ducks also visit the region in large numbers. Due to lack of water flow in the main channel, the adjoining riverine tract or *Kacha* land has been reclaimed by the influentials of the region for agricultural purposes. Several of the unique species of the region are under extreme threat due to illegal harvesting and habitat destruction.

**Field observations:** It has been found that this illegal activity was carried out when the water downstream Sukkur Barrage was available in the form of ponds. More than 400 dead turtles especially the brown river turtle (a hard shell species of turtle) were recorded in a two kilometre stretch downstream Sukkur on the left bank of the Indus River. Similarly, more than 100 soft shell turtles were recorded on the Barrage Gates (upstream), with their pieces cut. Similarly, downstream Sukkur Barrage, 4 soft shell turtles were also recorded with their hind calipee missing. The map of the study site and the sampling locations are shown in Fig. 1.



Disclaimer: The depiction and use of boundaries, geographic names and related data shown here do not necessarily imply official endorsement or acceptance by Pakistan Wetlands Programme / WWF-Pakistan.

Projection: Geographic  
 Datum: WGS 1984  
 Map produce by: PWP GIS Laboratory National Council for Conservation of Wildlife, Islamabad  
 Map production date: April 08th, 2010



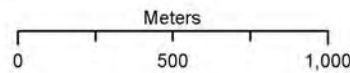
**Legend**

- Upstream
- Downstream
- District Boundary

Data Sources: PFRC, WWF-P, PWP, ESRI Online Imagery

**Fig. 1: Turtle Sampling Site at Sukkur Barrage**

Scale: 1:20,000



### **5.1.2. Sampling protocols**

Field observations of dead turtles along the banks of Indus River 6-7 km each upstream and downstream were carried out. Water, soil and tissue samples were collected from 13 different sampling points along the banks of the river Indus. Three specimens of hard shell turtles were collected whereas the soft shell specimens were not in a good shape as they were decayed. The samples were immediately despatched to relevant Labs (National Agriculture Research Centre – NARC) for detailed analyses, in order to investigate the causes of large scale mortality of animals' in the Indus River. The specimen samples and the tissue samples were stored in the Pakistan Museum of Natural History (PMNH), in case further analyses are required. The results of the detailed analyses are awaited, but the preliminary investigations have revealed that Potassium Cyanide (locally called as ANDA POTASH) has been used.

Geographical locations of all the samples collected during the field investigation were recorded using a GPS receiver. At each location, photographic evidences were recorded using Sony Cybershot (Digital) Camera. Binoculars were used to find out evidences of any other dead animals especially the birds. Dissection Kit was used to get tissue samples for genetic analyses. The tissue samples were preserved in EDTA tubes containing buffer solution. Gloves were used to collect specimens and tissue samples. The specimens were later preserved in a formalin solution in air tight drums.

### **5.2. Meetings and interviews**

Meetings with the local representatives of the respective provincial line departments were held in order to investigate the problem occurred downstream Sukkur Barrage. During the meetings, the roles of different departments were discussed and the steps they had taken so far in order to find out the solution to the problem was deliberated upon. During discussions, the provincial line departments shared their area of jurisdictions and the problems they are facing in controlling such areas and the illegal activities. At the end, several recommendations were put forth by the departments in order to effectively control and manage the species of the regions.

The meetings were held with the local representatives of the following provincial departments.

1. Sindh Environment Protection Agency (EPA)
2. Sindh Wildlife Department
3. Sindh Fisheries Department
4. Sindh Forest Department

In addition, detailed meetings were also held with the representatives of Pakistan Fisherfolk Forum (PFF), District Sukkur in order to record their point of view, for the problem. The president of the PFF Mr. Sher Muhammad Meerani and General Secretary of PFF Mr. Muhammad Nawaz Meerani emphasised on the need to revert the decision from “Benazir Card” to the original “Contract System” for fish harvest. They further elaborated that the decision was made in haste and had short-term objectives and the PFF has realised now that the contract system was the best keeping in view the present circumstances. Several of the local fishermen said that it is really hard for them to survive along the banks of Indus River due to such illegal activities which have resulted in a bad environment. They further said that their dependence on the Indus River's water (drinking and livestock), fish and recreational activities has reduced tremendously due to such illegal and lethal activities.

The detailed list of people contacted during the survey is mentioned in Table 3.



**Table 3:** List of people contacted during field investigation

| #  | Names                        | Designation   | Department                            |
|----|------------------------------|---|---------------------------------------|
| 1  | Muhammad Nawaz Meerani       | Acting General Secretary                              | PFF, Sukkur                           |
| 2  | Sher Muhammad Meerani        | President   | PFF, Sukkur                           |
| 3  | Ghulam Muhammad Gadani       | Deputy Conservator                                    | Sindh Wildlife Department, Sukkur     |
| 4  | Mir Akhtar Talpur            | In-charge Dolphin Conservation and Information Centre | Sindh Wildlife Department, Sukkur     |
| 5  | Munir Ahmad Abbassi          | Assistant Director                                    | Sindh EPA, Sukkur                     |
| 6  | Ghulam Mustafa Gopang        | Deputy Director / District Officer                    | Sindh Fisheries Department, Sukkur    |
| 7  | Muhammad Mujtaba             | Director  | Sindh Fisheries Department, Hyderabad |
| 8  | Tahir Qureshi                | Director  | IUCN – Pakistan                       |
| 9  | Abdul Jabbar Qazi            | Conservator   | Sindh Forest Department, Sukkur       |
| 10 | Saeed Dehu                   | Project Officer                                       | WWF-Pakistan, Sukkur                  |
| 11 | Liaqat Ali Khokhar           | Assistant Project Officer                             | WWF-Pakistan, Sukkur                  |
| 12 | Muhammad Dilbar Khan Meerani | Head / In-charge                                      | Sharfabad Welfare Association, Sukkur |

A detailed meeting with Tahir Qureshi, the representative of the IUCN Pakistan, was held in order to develop a consensus for the solution of such problems in future. Several options were discussed in the presence of Deputy Conservator, Sindh Wildlife Department especially to conserve the Indus River biodiversity and to protect these resources from illegal activities such as the poisoning of water with toxic chemicals. Both WWF and IUCN-Pakistan agreed to work together in the region.

### 5.3. Media coverage

Local representatives of the *AAJ News* contacted the team for sharing further information on the issue. The interview was conducted on the site downstream Sukkur Barrage which was aired three times. During interview, it was emphasised that a coordinated efforts are required to deal with such situations in future.

## 6. Recommendations

The recommendations have been categorised at three different levels: Federal, provincial and District or community level, based on the field investigations, for effective implementation.

### 6.1. Federal Level

1. It is strongly recommended that the Honourable Federal Minister for Environment and the Chairman Pakistan Fisherfolk Forum should hold a joint meeting in order to discuss the issues related to Indus River biodiversity conservation. A public statement in a press conference by both the leaders may help resolve such specific issues e.g. poisoning of water with toxic chemicals and unsustainable fishing practices. In this way, PFF may be taken into confidence to take strict measures against the culprits who are involved in such activities.

2. The Honourable Federal Minister for Environment should write to the Chief Minister Sindh, appraising him about the recent illegal activity in the Indus River, especially downstream Sukkur Barrage. This letter should also mention the significant biodiversity of the province and the threats faced to the unique wildlife of the region. In addition, it is also suggested to hold a joint session with the Chief Minister Sindh, where the Honourable Federal Minister for Environment should present the findings of the recent catastrophe in the Indus River. This will further pave the way for assuring the control of turtle capture and trade and the influentials who are significantly involved in this activity.
3. The Federal Ministry of Environment, through Pakistan Wetlands Programme should write popular news articles to enhance the awareness levels of the national and international consumers regarding the poisonous activities involved to kill the freshwater biodiversity especially the turtles. This will ultimately affect the health of the consumers in the long run and will also restrict the use of illegally harvested animals.
4. A two day long training workshop is strongly recommended for the Customs Department for the identification of turtles and their parts. This is specifically recommended for those professionals who are posted at international exit ports.
5. The PWP recommends the formulation of a “Freshwater Turtles Conservation Action Plan” for the next five years in collaboration with the concerned government departments and to ensure its implementation once it is approved from stakeholders.

## **6.2. Provincial Level**

1. Freshwater turtles should immediately be designated as protected animals in the Sindh Wildlife Protection Ordinance 1972. This will provide an opportunity to the Sindh Wildlife Department to pursue against the culprits, more effectively.
2. Interprovincial coordination should be enhanced under the chairmanship of Federal Secretary for Environment using NCCW as the platform. All the provincial wildlife and fisheries departmental heads should be requested to attend meetings regularly so that specific issues common to all provinces could be discussed in detail and effectively addressed.
3. Disaster management plan for Indus River should be developed on a priority basis. This plan should address issues related to chemical poisoning, toxic industrial effluents, sewage and all other issues e.g. water quality monitoring etc. which can pose a serious threat to the Indus River biodiversity especially the endemic Indus Blind Dolphin.
4. The Pakistan Wetlands Programme has already developed a “Turtle Poster” both in the English and Urdu language, which contains information about the turtle species of Pakistan and also mentions threats to their survival. Keeping in view the target audience around Sukkur Barrage and also to enhance the level of awareness, the Turtle Poster should also be developed in local *Sindh* language for widespread distribution.
5. A provincial level media awareness campaign should be launched in order to highlight the importance of Indus River Ecosystem. The media campaign should specifically address turtle capture and trade issues and the people who are involved in this business. WWF-Pakistan should take a lead in this case.
6. Pakistan Fisherfolk Forum has been successful in the past in introducing “Benazir Card” for poor fisherfolk, which costs Pak. Rs. 10/- per annum. This practice has resulted in an unsustainable harvesting of fish and associated species, as several of the card holders are not the fishermen, rather occasional sport hunters. It is strongly recommended to the

provincial government of Sindh to again switch back to the Contractor System, where only one person is responsible for managing fish catch and he is held responsible for all illegal activities. Deviations from the contractual agreements may even result in the cancellation of the contract of the contractor.

### **6.3. Community Level / District Level**

1. District level monitoring team should be established with representatives of all the line departments specially Sindh EPA, Sindh Wildlife Department, Sindh Forest and Fisheries Department, Sindh Police, WWF-Pakistan, PFF, and local representative of PWP, MoE, under the chairmanship of District Coordination Officer (DCO) Sukkur. The committee should meet on a regularly basis and WWF-Pakistan should act as a facilitator. The PWP should also merge this forum with the Wetlands Management Committee of Central Indus Wetlands Complex.
2. WWF-Pakistan through its two large programmes should initiate poverty alleviation programmes for the local fisherfolk in order to conserve the significant biodiversity of the region.
3. It is strongly recommended that local fishermen and CBOs e.g. Sharfabad Welfare Association and others should be organised in a way which may act as INDUS MONITORS. This is recommended to help stop the illegal and ruthless killing of freshwater turtles upstream and downstream of Sukkur Barrage.
4. Preferably the region between Guddu to Sukkur should be declared as no fishing zone. However, keeping in view the practicability of the conservation initiatives, initially two regions are strongly recommended to be declared as no fishing zones, to be notified by the Sindh Fisheries Department and Sindh Wildlife Department:
  - a. 5-km downstream Guddu Barrage; and,
  - b. 5-km upstream and downstream Sukkur Barrage.

## Photographic evidences of the field investigation



Downstream Sukkur Barrage, the Indus River



People and livestock, dependent on water of the Indus River, downstream Sukkur Barrage



A softshell turtle with its calipee cut off, found buried downstream Sukkur Barrage



A softshell turtle found dead upstream Sukkur Barrage



Carcases of softshell turtles at Sukkur Barrage gate



Dead hard shell turtles ashore the Indus River, downstream Sukkur Barrage



Meeting with the President of Pakistan Fisherfolk Forum, at Sharfabad



Meeting with General Secretary of Pakistan Fisherfolk Forum, upstream Sukkur Barrage



On site interviews with local people



Interview to AAJ T.V. Channel



PWP's investigation team collecting turtle's tissue samples



Soil sampling from the affected site, downstream Sukkur Barrage