



*(FINAL TECHNICAL REPORT)*

# Strengthening Community Participation in Protecting the Fresh Water Network in Malakand Civil Division

*Funded by:*  
**Scientific Committee WWF-Pakistan**

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## LIST OF ABBREVIATIONS

CBO	Community Based Organization
ECC	Elum Coordination Council
EE	Environmental Education
EPS	Environmental Protection Society
FCC	Fish Conservation Committee
HUJRA	Human Understanding by Justified and Rational Action
MRNP	Malakand River Network Project
MDDA	Malakand Division Development Authority
NGO	Non Governmental Organization
NWFP	North West Frontier Province
PA	Protected Area
VDC	Village Development Council
WWF	World Wide Fund for Nature



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AHMAD SAID  
Project Coordinator



## Introduction

Malakand Division is located in northern Pakistan. High mountain ranges, snow-covered peaks, glaciers and lush green forests characterize the area. Being rich in biodiversity, the area is simply different from other parts of the country.

The Malakand River Network (MRN) comprises of river Swat (Swat district), river Barandu (Buner district), river Shangla (Shangla district), river Panjkora (Dir district) and river Chitral (Chitral district) along with tributaries joining all along the rivers' courses.

Having ample resources of known fauna and cold waters, the freshwater ecosystem of MRN, especially river Swat and river Barandu, have tremendous biological importance. The river network is acting as the "backbone" in the economy of the region. Its water is used in irrigation, the major economic activity of the area. The network also acts as a major source of water for domestic, commercial and industrial uses.

Beyond all these, the freshwater ecosystem is supporting a number of aquatic plants and species, some being indigenous among the fish variety such as Mahasheer (*Barbus putitora*), Swati (*Shizothorax plagiostomus*), Thalk (*Shizothorax spp*), Chunr (*Shizothorax esocinus*), Marmahai (*Mestacembelus armatus*), Katararay (*Channa punctatus*), Deqai (*Gara gotyla*), Singi (*Triplophysa naziri*), Braitai (*Triplophysa chorai*), Braitai (*Triplophysa alipidata*) and Gulabi (*Glyptothorax stoki*) besides the exotic trout species (Rainbow and Brown Trout). Fish meat not only takes care of protein needs of the local people but also a large number of people depend on fishing as a source of income. Besides amateur fishermen, on an average, three professional fishermen per village are actively involved in harvesting fish resources throughout the year thus putting undue pressure on fish fauna. The factor of *unsustainability* is increased through the involvement of recreational fishing and by the use of illegal fishing techniques: dynamites, electric currents, poison. Reduced flow of water in the streams and rivers, because of climate changes, and under-sized fish catch through different inhuman fishing methods have decreased the fish population to an alarming stage, both in numbers and sizes.

Water pollution is another major threat to fish fauna. Disposal of solid and liquid waste from hotels, residential areas, industries, and municipalities has greatly disturbed water quality of the network. This is leading to the process of eutrophication of marshes and ponds resulting in the degradation of fish breeding grounds. Uses of illicit fishing means have put some of the fish species at the verge of extinction. The populations of fish species like Mahasheer and Thalk has remarkably decreased and are considered 'endangered'. Fish reserves, notified by the Fisheries Department, at Chakdara and river Barandu, are still



supporting the endangered Mahasheer. On the other hand, however, 'Thalk' has no such identified hotspots and is found, only rarely, in some parts of river Swat. Following are some of the most alarming factors contributing to degradation of fish fauna:

- Use of unethical fishing means (dynamiting, electric current, poisoning)
- Fishing during breeding season
- Undersized fish catch
- Habitat destruction
- Liquid and solid waste disposal
- Lack of awareness

Realizing the gravity of situation, WWF-Pakistan initiated a project in 1997 to correct the situation. Findings of the report revealed that the fish fauna of Malakand River Network is under great stress of illegal and unethical fishing practices. The study explored various causes leading to the degradation of fresh water ecosystem including lack of awareness, lack of community participation, inadequate protected areas management practices, and deficiencies in the working of custodian government department. To explore the possible community participation in the protection of ecosystem, Fish Conservation Committees (FCCs) were established in the villages located along the network. Most of the FCCs agreed to put a halt to the prevailing situation by extending their full cooperation. Being a feasibility-based study, the project had little to do with strengthening the liaison with the FCCs and their capacity building.

To ensure the community involvement in the conservation of critical fish fauna and the continuity of the activities already initiated, this project titled 'Strengthening Community Participation in Protecting the Freshwater Network in Malakand Civil Division' was launched in January, 2000. The sustainability of faunal resources in the river network and its tributaries is related among others, to the level of awareness of the people residing along the watercourses. Therefore, most of the activities were focussed on raising the level of awareness of the local communities and school children.

## **PROJECT AREA**

River Swat, river Barandu, river Panjkora (Dir District), river Shangla (Shangla District) and river Chitral (Chitral District) form the network of freshwater ecosystem in Malakand Civil Division. Project activities, however, remained confined to dealing with the communities living along river Swat and river Barandu. Six villages in district Dir, but located along river Swat, were also involved in the conservation of fish fauna. Selection of rivers was based on the fish diversity and severity of illegal fishing and the importance of river in the



region with focus on the conservation of critical fish species, especially Mahasheer and Thalk.

Fed by glaciers, rain and snow, the union of river Ushu and river Gabral at Kalam forms river Swat. The former originates in the highest mountainous range bordering Chitral, while the latter rises from the hills of Badagai in northern Swat Kohistan.

Flowing almost through the centre of northern parts of Swat district, the river enters Malakand Agency at Landaki. From there, flowing to the north of Malakand Agency, it also acts as an administrative boundary between district Dir and Malakand Agency till it is joined by river Panjkora from Dir near the village Totakan. Numerous small streams and tributaries also join the main water body at various localities all along its course from Kalam to Totakan.

River Panjkora originates in Dir-Kohistan, flows in the north-south direction, receiving various tributaries on its both banks all along its course in the district. In the extreme south of the district, the river falls into river Swat near Kolangi village.

Originating from the watersheds of Elum hills, at the boundary of Swat and Buner districts, river Barandu is the main rivulet of the district.

The native fish fauna of river Swat is found in Madyan and downstream. Similarly, from Wari to Kolangi, Panjkora River supports indigenous fish species. The whole river Barandu is host to the native fish species.

Thirty (30) Fish Conservation Committees (FCCs) have been established in the villages and towns along these rivers. Project area and location of FCCs and the four community-based fish reserves are shown in Figure-1.



## **PROJECT RATIONALE**

- Freshwater network of Malakand has tremendous biological, economic, social and recreational values for the residents of Malakand Division and the visitors from other parts of Pakistan
- Aquatic fauna is rapidly deteriorating both in quality (size!) and numbers. This would be a big loss (and embarrassment) if we loose some of the finest fish species without being able to even initiate some work to save them from extinction. This project is aimed in this direction.
- A large number of people depend on the fresh water resources of Malakand division.
- Hence the need for this project

## **PROJECT OBJECTIVES**

- Maintain linkages with the communities stakeholder for the conservation of critical fish fauna
- Create awareness amongst the communities and other stakeholders and school children residing along the MRN
- Establish linkages with and networking of NGOs working for the conservation of freshwater network of Malakand Civil Division

## **PROJECT ACTIVITIES**

- Thirty Fish Conservation Associations already established, were strengthened further
- Nature Clubs established: 50% in boys and 50% in girls schools
- Material on environmental education developed and disseminated
- Meetings/workshops/seminars held with NGOs and concerned government departments, to work from a common platform for the cause of fish conservation
- Hold training workshops for the communities and schoolteachers to raise their level of awareness



## PROJECT ACHIEVEMENTS

### Objective # 1

*Maintain linkages with communities and stakeholders for the conservation of critical fish fauna*

#### Activities to achieve the objective

During the pilot project study, 44 fish conservation associations were established in three districts: 30 in the Swat region, 3 in Buner, 6 Dir and 5 in Malakand Agency.

As in some localities the use of inhuman fishing methods does not exist, therefore the development of linkages with those communities, where such practices were in vogue. The following criteria was set forth for the selection of FCCs:

- FCCs located along the river banks
- Illegal fishing practices were common
- FCCs were willing to declare section of the river passing through their village as “protected”
- FCCs having people who have influence in the area and were ready to use it in a positive manner
- Villages where schools exist

Based on the above criteria, 30 FCCs were selected: 22 in Swat; 6 in Dir; 2 in Buner.

#### Outputs for Objective 1

- Awareness level raised through dialogues, meetings, workshops, educational materials, walks, and seminars
- Linkages developed between FCCs and the line agencies to handle the situation in the long-term perspective and to sustain the process of conservation
- Fish Conservation Committees greatly succeeded to overcome the problem of illegal fishing

Table-1 shows the control status over illegal fishing means:



**Table-1: Control status over illegal fishing practices through FCCs**

District	70% control	90% control	100% control	Total FCCs per District
SWAT	13	7	2	22
DIR	6	-	-	6
BUNER	-	2	-	2
Total	19	9	2	30

Though not very significant, but even 2 of the 22 localities in Swat district having completely controlled illegal fishing practices, is a tremendous success.

- Community based Protected Areas (PAs) declared

The declaration of fish reserve is a practical step towards the protection and conservation of fish fauna. Based on the interest of the local people to minimize the pressure on fish hotspots, provide a safe habitat to the aquatic fauna, and to increase the fish population, four hotspots were declared as protected areas (PAs). Control and management of the reserves was assigned to the respective fish conservation committees. Following are the selection criteria on the basis of which the four conservancies were established:

- Sites having a variety of fish species
- Support a good population of fish
- Have breeding grounds for fish
- Water flows throughout the year
- Are under the threat of over-fishing
- Is the common property of the community

After selection of a PA, a segment of a river, the following steps were taken jointly to further clarify the position of area and the status of fish population in the reserve:

- Boundaries demarcated
- Publicity done about protected river strips in adjoining areas
- Comprehensive awareness-raising program run
- Fish population surveys conducted
- “Bye-laws” for fish reserves being framed

Total length of the declared reserved segments for four PAs is 3,300 meters.



Table-2 shows the location and details of four conservancies:

**Table-2 Declared Fish hotspots as Protected Areas through FCCs along river Swat**

Village having FCCs	Village on the opposite bank	Length (meters)
Alamgunj	Bamakhela	800
Ghalaigai	Parrai	500
Barikot	Nagoha	700
Guratai	Shamozai	1,300
<b>Total length</b>		<b>3,300</b>

### Evaluation of the Conservancies

This is based on two factors: data collected regarding the dependence of professional fishermen community on the fish and average fish catch. If these reserves are managed properly, there are great chances of the rehabilitation of fish fauna in the network.

The following calculations show the value of fish catch per annum in the four conservancies and the monetary benefits that it entails to the professional fisherman (Table 3):

**Table-3: Fish catch activity and monetary benefits to fishermen**

Activity	Quantity
Number of conservancies	4
Average number of professional fishermen per conservancy	3
Total number of professional fishermen in four conservancies	12
Average daily fish catch per fisherman	1.5 kg
Total daily catch for four Protected Areas (12*1.5)	<b>18 kg</b>
Average number of catch days per month	22
Total number of catch-days per year	<b>198</b>
Total yearly fish catch (18 kg * 198 days)	<b>3,564 kg</b>
Average fish price per kg	Rs.100
Total value of fish catch (3,564 kg * 100 Rupees)	Rs.356,400

Though not a significant amount, but if looked in the perspective of all the 30 FCCs and under the assumption that (more or less) similar income could be accruing to the to the fishermen, we would come up with more than 2,000,000 rupees.

### Fish population surveys

To know the current status of fish population as well as the species diversity in declared protected areas, fish population surveys were conducted. Hand-netting



and netting from raft with the technical help of local fishermen were used to conduct the survey.

### P.A. Alam Gunj

- Date: 13-07-2000
- Time: 10:45 a.m.
- Temp: 30°C
- Weather: Sunny
- Water status: Muddy
- River strip surveyed: 600 meters

Table-4: Fish catch in the river strip of Alam Gunj: Survey-1

Survey No.	Netting method	Nets thrown	Nets with catch	No. of fish caught	Species caught		Size
1	Hand netting	46	3	1	Ghound Saray	<i>Shizothorax spp.</i>	16.5 cm (6.5")
				2	Deqai	<i>Gara gottyla</i>	5.88 cm (2.3")
				2	Singi	<i>Tripplophysonaziri</i>	(6.4 cm) 2.5"

NB: All the fish were under-sized

- Date: 13-07-2000
- Time: 02:50 p.m.
- Temp: 32°C
- Weather: Sunny
- Water status: Muddy
- River strip surveyed: 700 meters

Table-5: Fish catch in the river strip of Alam Gunj: Survey-2

Survey No.	Netting method	Nets thrown	Net with catch	Fish caught	Species		Size
2	Netting	36	1	1	Ghound Saray	<i>Shizothorox plagiastomus</i>	25.4 cm (10")

### P.A. Ghalaigay

- Date: 2-5-2001
- Time: 11:05 a.m.
- Temperature: 29°C
- Weather: Sunny
- Water status: Low silt load
- Methodology: Netting from raft
- River stripe surveyed: 500 m



Table-6: Fish catch in the river strip of Ghalaigay

Netting method	Nets thrown	Nets with catch	Fish caught	Species		Size
Raft netting	19	3	1	Deqai	<i>Gara gotyla</i>	7.6 cm (3")
			2	Deqai	<i>Gara gotyla</i>	15.2 cm; 14 cm (6"; 5.5")
			1	Asilgay	<i>Shizothorax spp</i>	24.1 cm (9.5")

### P.A. Barikot

- Date: 2-5-2001
- Time: 12:30 p.m.
- Temperature: 30° C
- Weather: Sunny
- Water status: With low silt load
- Methodology: Netting from raft
- Area surveyed: 700 meters

Table-7: Fish catch in the river strip of Barikot

Method used	Nets thrown	Nets with catch	Fish caught	Species		Size
Raft netting	28	4	2	Degai	<i>Gara gotyla</i>	16.5 cm; 17.8 cm (6.5", 7")
			1	Asilgai	<i>Shizothorax spp.</i>	25.4 cm (10")
			3	Degai	<i>Gara gotyla</i>	12.7 cm; 12.7 cm; 17.8 cm (5"; 5"; 7")
			2	Asilgai	<i>Shizothorax spp.</i>	21.6 cm; 22.9 cm (8.5"; 9")

### Comment

Surveys indicate that the fish population is not good. The number of nets thrown and the methods used should have given better results. Under normal circumstances, however, the result do point to the fact that fish fauna is rare, besides being of smaller sizes.

### By-laws formulation

One of the components of the project activities was to develop by-laws for the conservation of aquatic fauna and its implementation at village level. By-laws were subsequently framed for the localities having declared fish reserves while



taking in account the local customs and traditions of ownership over the protected part of the river strip.

It may be mentioned that the by-laws are only restricted to deal with un-natural fishing methods. The laws were framed through mutual agreement among WWF, FCCs, and Fisheries Department, besides the Environmental Protection Society.

### **Installation of a signboard**

A signboard was designed and developed for a protected area and installed at Alamgunj at an appropriate location. It carries the message about declared protected area and 'no fishing allowed'. EPS extended the financial assistant for the board.

### **Capacity building of FCCs**

In order to strengthen the role of local communities in the protection of freshwater ecosystem, the FCCs were enabled to develop liaison with line agencies and NGOs working in the area. The FCCs have succeeded to resolve some of the conservation problems at village level as well as at tehsil level.

### **Objective 2**

*Create awareness amongst communities, other stakeholders and the school children residing along MRN*

### **Activities towards achievement of the objective**

District Education Officers of both male and female schools were contacted and briefed about the aims and objectives of the project. Heads of the respective schools were informed through formal letters and permission taken for the activities.

### **Selection criteria of schools**

- High schools located in villages where FCCs existed
- Located near river strips belonging to a particular village
- Schools where nature conservation activities did not exist

Based on the above criteria, 10 schools were selected

### **Criteria for the establishment of Nature Clubs**

- Students of 7<sup>th</sup>, 8<sup>th</sup>, 9<sup>th</sup> classes
- Willing to be members
- Science teacher ready to head the clubs



- Students already involved in social activities such as scouting, clean-up operations
- Students belong to villages where FCCs existed

### **Lectures and environment related activities**

A series of lectures were delivered to the students of selected schools. These lectures covered the topics on general environment, biodiversity, threats to wildlife, and threats to freshwater ecosystem with focus on endangered aquatic species. Conservation issues and measures required were also discussed.

Members of nature clubs carried out clean up activities at school level. The students developed paintings and drawings highlighting different parts of ecosystem and environmental issues. Information was collected on local flora and fauna. They also distributed awareness raising materials in their villages.

### **Outputs for Objective 2**

- Nature clubs established with total strength of 190 members
- Teachers of respective schools trained in environmental education and conservation through teachers training workshops
- Awareness level raised within schools and of the local communities by conveying the message of conservation through students and teachers

### **Objective # 3**

*Establish linkages with and networking of NGOs working for the conservation of fresh water network of Malakand Division, partly or exclusively.*

### **Activities to achieve the objective**

This objective aimed at strengthening the liaison between line agencies and different stakeholders, and to work from a common platform for the cause of nature conservation in general and fish fauna in particular. The area of collaboration is directly linked with the custodian Fisheries Department that deals exclusively with the river network and its faunal resources. Malakand Division Development Authority (MDDA) collaborates in controlling the encroachment of riverbanks and water pollution. Some of the non-governmental organizations (NGOs) are working partly towards the protection of river ecosystem. The watershed management activity of the Forest Department is one of the activity carried out with the help of different community based organizations (CBOs).



Hotel Owners Associations are cooperating to minimize the disposal of solid and liquid effluents in streams. The association has also the mandate to check and make sure that their member hotels do not purchase under-sized fish from the fisherman and discourage the business during the breeding season of fish.

### **Outputs for Objective 3**

- **Memorandum of Understanding signed**

A memorandum of understanding was developed and signed to assign different responsibilities to the partner organizations. The memorandum helped in providing inputs for the achievement of project goals and to work from a common platform for the protection of freshwater bodies of Malakand Division (Annex-I)

- **Awareness raising program held in coordination with NGOs, CBOs, Government Departments and Hotel Owners Association**

In collaboration with Environmental Protection Society (EPS) and Ellum Coordination Council (ECC), a one-day walk and seminar was held against pollution and illegal fishing practices in river Swat.

The activity was a practical shape of the signed MoU for joint efforts to raise awareness among masses and different stakeholders

Participants of the program were local community members, representatives from different NGOs and CBOs including EPS, Hujra, Lassona, ECC, Fisheries Department, Wildlife Department and representatives from Swat Serena Hotel. Participants holding banners and placards were bearing the message of conservation. This was followed by a two-hour long seminar addressed by all the major stakeholders, including WWF.

- **Signboard installed**

Active partner of the coordination team, the Environmental Protection Society, provided financial assistance in developing a signboard for the protected area at Allamgunj. The board having the logo of WWF, EPS Swat and FCC Alamgunj reflects strong and everlasting coordination among the three agencies.

- **Raft donated to the Fisheries Department**

As illegal fishing is common, the local community and FCCs suggested that besides their efforts, the Fisheries Department should start mobile



inspections across the river on periodic basis in those areas of network that are not in the range of FCCs and are not accessible without a raft.

Suggestions from the community were discussed with the Assistant Director Fisheries, Swat who promised full cooperation by terming the raft as an effective tool for mobile inspection. The problem was also discussed with EPS that ensured its full cooperation. The Chief Technical Advisor, WWF-P suggested that his organization will extend financial assistance in this regard. The raft was designed, manufactured and donated to the Fisheries Department after signing a written agreement.



## CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the project and the things experienced during the implementation period of project, the following points are concluded:

1. Non-conventional and unethical fishing techniques such as dynamiting, poisoning, electrocuting, and catching in household utensils have adverse impacts on fish fauna. Water quality, river ecology, and socio-economic conditions of the dependent community are disturbed by the stated problems.
2. The practice of electrocuting is high in the villages located near the riverbanks. Poisoning is practiced in some of the localities - the most destructive method - because it does not make any noise and culprit commits it without any let or hindrance.
3. Dynamiting - the worst and inhuman technique - prevails all over the network. The method is easy and of low cost, though occasionally involves loss of limbs.
4. Stopping water in irrigation channels and streams for fish-catch results in rapid loss of aquatic creatures. These water bodies mostly act as breeding grounds for fish fauna. The method has no regard for the size and age group. Small fish that are of no use, are left to rot in the dried streams.
5. Undersized fish-catch with the help of different types of utensils, covered with cloth, has put all the fish species at high risk. The method prevails in the network and mostly young boys practice it.
6. As the river network has been left with a rare number of brooder fish, therefore undersized fishing could be a major factor in the vanishing fish population.
7. Based on all the above factors, Mahasheer and Thalk have reached the level of near-to-extinction, heading fast towards extinction
8. Lack of awareness regarding the rules is another problem: most of the local people have no regard for the existing rules and regulations, beside the deteriorating status of fish fauna. Many are not even aware of it.
9. Majority of the community wishes to have controlled fishing with the support of effective by- laws. They are willing to participate in the activities of FCC's. The local people have put their efforts in managing the protected areas. The declaration of community-based protected areas is a positive step towards the



conservation and a tool for the involvement of local people in conservation-related activities.

10. The Fisheries Department has provided protection to two hotspots of Mahasheer. The areas are located at Chakdara on river Swat and under the Daggar Bridge at river Barandu. The areas, however face the following problems:

- Lack of adequate and trained staff
- Inadequate sizes, unknown boundary range, and management of fish reserves
- Ineffective linkages with the local people and non-involvement of community
- Fishing by top civil bureaucracy

### **Recommendations**

To ensure the conservation of fish resources and its utilization in a sustainable manner, the following activities are recommended:

1. Aquaculture is poorly introduced in the project area. The activity is only restricted to the exotic trout. Its ecology is limited to a limited area in upper Swat. There are negligible fish farming activities in down stream areas of the river network. The local people are interested in the development of fish farms as a mean of additional income generation. The localities are suitable for the development of fish farms of indigenous species. Aquaculture needs to be introduced in the project area on demonstration bases, with the primary objective of reducing fishing pressure on the natural fish population in the river network and its tributaries
2. Fish hatcheries of the local fish species be developed to provide seedlings to fish farmers
3. Training programs should be organized for professional fishermen, local watchers, and staff of private fish-farms and local community in promotion of fish farms and proper protection techniques
4. School children and teachers can play an effective role in creating awareness in the community. The schoolteachers have already demonstrated their role well in raising the level of awareness by educating the young ones. This role can be further strengthened through intensive training of teachers.



5. Environmental education should be extended to other areas of the network not covered yet with this initiative
6. Awareness-raising programs including seminars, workshops should be continue, even extended to the localities that were not included in this project
7. Sustainable management plans for community based protected areas
8. To ensure maximum involvement of the local community in conservation, new community-based reserves be created
9. By-laws need to be refined further and implemented, in true spirit, for fish conservation
10. Authority and responsibilities should be shared between the Fisheries Department and the custodian communities, having declared fish reserves
11. Local communities should be involved in the development of management plans for fish reserves and allowed to manage recreational angling for income subsidization
12. Improvement in the management plans of the existing fish reserves declared by the Fisheries Department is needed
13. Rules and regulations for the control of illegal fishing methods must be updated, made fool-proof and with high penalties
14. Watch and ward activities should be improved through the provision of essential field equipment for the mobility and proper control by the watchers
15. There should be a total and effective ban on fishing during breeding seasons
16. Net and size be standardized to reduce risks of small fish coming in the net
17. Restocking of endangered and critical fish species should be practiced
18. Research and restocking centers (hatcheries) of endangered fishes is recommended to ensure conservation
19. To control pollution of water bodies and to protect fish habitats destruction, the following measures are recommended:
  - Depute staff, both technical and managerial in Malakand Division, to monitor and implement the provisions of the Environmental Protection Ordinance



- Conduct a feasibility study on the proper disposal of effluents from hotels and other commercial centers in the project area and prepare plans for its implementation
  - Train the local communities living along the rivers in safe and proper disposal of waste material
  - Domestic sewage originating from villages and towns should undergo at least simple treatment before it joins the river
  - To cope with the hotel wastes immediately, septic tanks must be constructed by the hotels
  - Effluent discharged by the marble factories and other industries should be properly handled. The EPA and concerned agencies must take steps to construct settling tanks for the effluent before discharging into the streams and rivers. In the long run, primary wastewater treatment plants are recommended.
  - To avoid the risk of pollution from agricultural run-off (pesticides, fertilizers), the following measures are recommended:
    - Use of non-degradable pesticides should be discontinued
    - Efforts should be made to introduce and use the degradable pesticides, if needed
    - Farmers need to be trained with regard to proper and safe application of agricultural chemicals
    - No industrial or developmental project should be allowed along the rivers in Malakand without the submission of Environmental Impact Assessment (EIA) report of the proposed project to the concerned authority
    - To make the local communities aware of the menaces of pollution, a comprehensive awareness campaign should be run throughout the area
    - Environmental education activities should be introduced at village level, regarding liquid and solid waste management technique
20. NGOs, CBOs, schools and the residents of the project area are well receptive to environment related activities, especially those dealing with fish



conservation. Further efforts are needed to keep the momentum of these activities.

21. A strong coordination network of local NGOs, CBOs, VDCs, Associations, line agencies (EPA, MDDA), law enforcing authorities and the concerned custodian government departments is needed to work from a common platform for the conservation of freshwater ecosystem. Newly established local government system could provide more effective coordination platform

## CONCLUSION

A long-term project is needed to meet the objectives of protecting endangered species and aquatic habitats. However, since that may take a year or two to come through, the Scientific Committee is requested to help in continuing the efforts for another two years so that, on the one hand, the previous efforts are not lost and, on the other, more information and lessons are available for effective implementation of a long-term project, if it come through.



## MEMORANDUM OF UNDERSTANDING

This memo is signed as an agreement among WWF-Pakistan, NWFP Fisheries Department, Environmental Protection Society and Fish Conservation Committees in order to work from a common platform for the conservation of freshwater network in Malakand Civil Division.

Responsibilities assigned to each organization:

### WWF-Pakistan

1. Help the existing FCCs through institutional strengthening process with partners
2. Formulate conservation by-laws for fishermen community through connective process with partner
3. Create awareness among the school children for the conservation of nature
4. Arrange awareness workshops/meetings for fishermen, local community and schoolteachers

### NWFP Fisheries Department

1. Provide technical input in the formulation of by-laws for FCCs to conserve fish resources
2. Help in strengthening the existing FCCs
3. Carry out period fish population surveys for mutually agreed sites in collaboration with partner organizations
4. Take appropriate action against illegal fishing as pointed out by the members of FCCs
5. Provide technical support in training workshops/seminars held for various target groups
6. Increase visual by keeping a close watch on illegal fishing practices and fishing in breeding season

### Environmental Protection Society

1. Cooperate with WWF-P in strengthening the existing FCCs
2. Work jointly with WWF-P in establishing nature clubs and providing environmental education in selected schools
3. Provide technical support in training workshops/seminars arranged by WWF-P



4. Develop joint work plans with WWF-P for meetings with FCCs and conducting various activities at selected schools

#### **Fish Conservation Committees**

1. Control illegal fishing practices (dynamiting, electrocuting, poisoning) in their areas
2. Cooperate in the formulation of by-laws for the conservation of fish fauna and in the implementation of such laws
3. Provide protection to the river section passing through their control, against all kinds of fishing practices
4. Participate in training workshops/seminars arranged by WWF-P, Fisheries Department and EPS
5. Keep a record of all the conservation activities and report to WWF-P and other partners about the progress