



# NATIONAL POLICY AND STRATEGY FOR FISHERIES AND AQUACULTURE DEVELOPMENT IN PAKISTAN

## Part 1



**Ministry of Food, Agriculture and Livestock  
Government of Pakistan  
Islamabad**

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## Acronyms

ADB	Asia Development Bank
ADP/PSDP	Annual Development Plan / Public Sector Development Programme
AJK	Azad Jammu and Kashmir
APO	Activity towards Plan Objective
AQD	Animal Quarantine Department
BCDA	Balochistan Coastal Development Authority
BFD	Balochistan Fisheries Department
BOI	Board of Investment
BOR	Board of Revenue
CBO	Community-Based Organisation
CBR	Central Board of Revenue
CCRF	Code of Conduct for Responsible Fisheries
CEMB	Centre of Excellence in Marine Biology (University of Karachi)
CIDA	Canada International Development Agency
CPI	Cleaner Protection Institutes
DANIDA	Danish International Development Agency
DFI	Development Financial Institution
DFID	Department for International Development (UK)
EAD	Economic Affairs Division
EDB	Export Development Board
EDF	Export Development Fund
EOBI	Employees Old-Age Benefits Institution
EPA	Environmental Protection Agency
EPZA	Export Processing Zones Authority
FAO	Food and Agriculture Organisation of the United Nations
FATA	Federally Administered Tribal Areas
FBS	Federal Bureau of Statistics
FCS	Fishermen's Cooperative Society
FPC	Forest Protection Committee
FTC	Fisheries Training Centres
GDA	Gwader Development Authority
GEF	Global Environment Facility
GOP	Government of Pakistan
HDP	Human Development Programme
HEC	Higher Education Commission
HPZ	High Potential Zone
ILO	International Labour Organisation
IOTC	Indian Ocean Tuna Commission
IRSA	Indus River System Authority
IUU	Illegal, Unreported and Unregulated [fishing]
IWMI	International Water Management Institute
JICA	Japan International Cooperation Agency
KFHA	Karachi Fish Harbour Authority
KOFHA	Korangi Fish Harbour Authority
KOICA	Korea International Cooperation Agency
KPT	Karachi Port Trust
MCS	Monitoring, Control and Surveillance
MFD	Marine Fisheries Department
MINFAL	Ministry of Food, Agriculture and Livestock
MMD	Mercantile Marine Department
MOE	Ministry of Environment
MOST	Ministry of Science and Technology
MPA	Marine Protected Area
MPS	Ministry of Ports and Shipping
MSA	Maritime Security Agency
MSY	Maximum Sustainable Yield

MRD	Marketing Research Department
MTDF	Mid-Term Development Framework
NACA	Network of Aquaculture Centres in Asia-Pacific
NARC	National Agricultural Research Centre
NVWW	National Council for Conservation of Wildlife
NEAP	National Environment Action Plan
NEQS	National Environmental Quality Standard
NGO	Non-Governmental Organisation
NIBGE	National Institute for Biotechnology & Genetic Engineering
NIO	National Institute of Oceanography
NIPA	National Institute of Public Administration
NOC	No Objection Certificate
NORAD	Norwegian Agency for Development Cooperation
NRSP	National Rural Support Programme
NWFP	North West Frontier Province
P & D Dept.	Planning and Development Department
PARC	Pakistan Agricultural Research Council
PCSIR	Pakistan Council for Scientific and Industrial Research
PERI	Punjab Economic Research Institute
PFF	Pakistan Fisherfolk Forum
PIDE	Pakistan Institute of Development Economics
PN	Pakistan Navy
PO	Plan Objective
PQA	Port Qasim Authority
PSF	Pakistan Science Foundation
PSIA	Pakistan Seafood Industries Association
SA	Strategy Axis
SAARC	South Asian Association for Regional Cooperation
SBP	State Bank of Pakistan
SCDA	Sindh Coastal Development Authority
SDPI	Sustainable Development Policy Institute
SEAFDEC	Southeast Asian Fisheries Development Centre
SFD	Saudi Fund for Development
SIDA	Swedish International Development Agency
SME	Small and Medium Enterprises
SMEDA	Small and Medium Enterprises Development Authority
SNE	Sanctioned New Expenditure
STREAM	Support to Regional Aquatic Resources Management
SUPARCO	Space and Upper Atmospheric Research Commission
TED	Turtle Excluder Device
TURF	Territorial Use Rights in Fisheries
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organisation
UNIFEM	United Nations Development Fund for Women
WAPDA	Water and Power Development Authority
WB	World Bank
WFC	World Fish Center
WWF	World Wildlife Fund for Nature
ZSD	Zoological Survey Department
ZTBL	Zari Taraquati Bank Limited (formerly Agricultural Development Bank of Pakistan)

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## **Foreword**

The National Policy and Strategy for Fisheries and Aquaculture Development in Pakistan is the result of a comprehensive consultative process that has involved a large number of stakeholders at all levels between 2004 and 2006.

The National Policy and Strategy for Fisheries and Aquaculture Development in Pakistan is constituted of several parts. Part 1 presents the policy, strategy and its implementation plan (activities). Part 2 details the institutional arrangements necessary for the overseeing of the policy implementation process, as well as project concept notes elaborated by the GOP towards the implementation of the policy. Part 3 is constituted of a legal review of the policy, with recommendations for legal improvements to support implementation. While Part 1 is here to stay and will guide the Government of Pakistan in achieving the policy goals, supportive Parts 2 and 3, at the time of writing, were work in progress and may be subsequently modified/updated.

It is understood that the present National Policy and Strategy for Fisheries and Aquaculture Development in Pakistan does not supplant, nor contradict, previous policies elaborated for the fisheries and aquaculture sectors.

## Policy formulation process

### *The components of a policy document – a brief overview*

A policy document is formulated to give directions to the development of a sector. The results of a planning process, like the one undertaken to formulate this document, can be disaggregated into a framework with four linked steps: policy goals; strategies with objectives; a plan; and a series of activities. While strategies deal with the ‘how’ of policy goals, plans and activities deal with ‘what’, ‘who’ and ‘when’ questions in relation to policy implementation.

Following the identification of key issues and problems, the first step is the articulation of the broad policy goals in a *policy* framework. This spells out directions of development a country wishes to follow for a given sector, e.g. fisheries and aquaculture. By their very nature, these tend to be broad in scope and may typically relate to issues such as sustainable resource exploitation, poverty alleviation, food security and economic growth.

Designing a *strategy* comes second, as a strategy takes each policy goal and envisages how it could be met. It is normal for each policy goal to be supported by a number of different strategies. Also of importance is the specification of cross-cutting strategies in support of more than one policy goal and sometimes other strategy objectives. For example, strategies relating to human and institutional capacity development, research, and strengthening cross-sectoral collaboration may all help to support a number of policy goals, as well as the realisation of objectives of a more ‘technical’ nature.

How to go about achieving the strategy objectives is provided in the *plan* (the third step). The plan specifies the desired results which, if realized, would support each strategy objective. Again, each strategy may have a number of plans supporting it.

The fourth and final stage is to specify the detailed *activities* to be undertaken as part of each plan. These activities should be time-bound, and have allocated responsibilities to those required to undertake them.

It is sometimes possible to specify activities at the third stage, and combine them as part of a plan of activities in support of strategies. The current policy document is based on three steps: policy, strategy, and plan of activities for the development of fisheries and aquaculture in Pakistan.

### *Fisheries and aquaculture policy formulation in Pakistan – the chronology of events*

Past policies:

No national fisheries and aquaculture specific policy has been made in Pakistan in the past. Fisheries issues were covered, to various extents, under agriculture policies or livestock policies. Although reports of the Agriculture Enquiry Committee in the 1970’s and of the National Agriculture Commission in 1987 gave some attention to the fisheries sector, they did not make a major impact because problems of the sector were only inadequately addressed. Policies have, however, been made for deep sea fishing in 1988, 1995 and 2001 but these were specifically aimed at the promotion of fishing under licensing arrangements in the Exclusive Economic Zone of Pakistan and only marginally covered aspects of local/small-scale coastal fisheries.

Five Year Plans have been prepared in past for medium term planning. A separate committee for fisheries was constituted for the preparation of these plans and its recommendations accommodated. However, none of the five year plans have catered for many of the broad issues faced by those in the fisheries and aquaculture sectors.

Government Task Forces for inland and marine fisheries and aquaculture:

Two Task Forces were constituted by the Ministry of Food, Agriculture and Livestock (MINFAL) of the Government of Pakistan in 2004 for the preparation of National Fisheries Policy. A Task Force dealt with inland fisheries and aquaculture, and the other with marine fisheries and aquaculture. Through a collaborative process at Provincial/Areas and federal levels, these two sub-groups prepared policy documents related to their areas of work.

TCP request:

In 2004, the Federal Government (MINFAL) approached FAO to fund a technical cooperation project (TCP) to assist in the process of formulating a policy and a strategy to enhance fisheries and aquaculture development in the country. The TCP (TCP/PAK/3005), approved and funded in May 2005, agreed on the following:

*Project goal:* to create an enabling environment conducive to the sustainable development and management of a growing fisheries and aquaculture sector, with emphasis on its contribution to economic growth, poverty alleviation, food security and environmental conservation.

*Project purpose:* to support the on-going fisheries and aquaculture policy and strategy development process in Pakistan and to facilitate its implementation.

*Project outputs:* i) An agreement on the appropriate course of actions for the project to follow and required contribution to Pakistan's on-going policy processes; ii) A well-defined fisheries and aquaculture policy and strategy based on good consultation; iii) An effective implementation plan for the policy and strategy at national and Provincial/Areas levels.

It was agreed that all Provinces and Areas of Pakistan should be targeted.

### ***The approach used in the TCP: bottom-up and consensus-based policy formulation***

An FAO TCP Inception Workshop was conducted in June 2005, during which a wide range of stakeholders prepared a detailed project implementation plan. The outcomes from the two government task forces were amalgamated into a single "National Fisheries Policy" draft. The contents of this draft were synthesised into a 'policy brief' by the international consultant hired by the project, and taken, with the assistance of NACA-STREAM, through a first round of community consultations across the four provinces. The policy brief was also sent to numerous stakeholders from Provincial/Areas Governments, Harbour authorities, NGOs etc. who provided their comments in written form. Based on what was learned and recorded during this first phase of community consultations and the feedback received from consulted stakeholders, the draft policy was then redrafted by FAO. Task force members and other project stakeholders from the Government of Pakistan, NACA and an international fisheries consultancy company (Poseidon Ltd.), made observations on its contents, which were then further revised by FAO until a consensus was reached. A round of Provincial/Areas stakeholder consultations followed, in which participants gave their inputs for prioritization of the various recommendations made in the draft policy document, and on its implementation. Following these Provincial/Areas stakeholder consultations in two districts of each of the four provinces, the policy document was further modified and re-named "National Policy and Strategy for Fisheries and Aquaculture Development in Pakistan".

Moving upwards from communities to Provincial/Areas governments, the policy document was then presented at two Provincial/Areas Workshops to representatives from a wide range of government and non-government institutions and organizations from the four provinces concerned as well as areas of the country. Workshop participants used the draft “National Policy and Strategy for Fisheries and Aquaculture Development in Pakistan” as the basis for practical discussion about implementation issues and priorities, and reflected on specificities (e.g. partnerships necessary, timelines, funding and targets) of the activities to achieve the strategy objectives.

Outputs from the Provincial/Areas workshops were then incorporated into the “National Policy and Strategy for Fisheries and Aquaculture Development in Pakistan” draft, which was further refined into a final draft.

The contents of this final draft document, and in particular sections related to the implementation of policy, were thoroughly discussed during a national workshop gathering federal-level government officials from MINFAL and other in-line ministries as well as provincial/area departments, and Chief Province Secretaries. Based on the outputs of the workshop, final amendments were brought to the draft policy document, which was then presented to the Secretary of MINFAL, Provinces’ Chief Secretaries and other high-ranking Government Officials during a high-level meeting. Endorsement of the document and its contents was sought and obtained.

The legal implications of the “National Policy and Strategy for Fisheries and Aquaculture Development in Pakistan” were evaluated by a fisheries legislation expert and are reported in appended Part 2. The present policy document was then submitted, along with suggested legislative amendments, to the Cabinet for its approval.

Institutional arrangements to support the implementation of the policy, in harmony with the Government’s desire to emphasise agri-businesses approaches to the development of the fisheries and aquaculture sectors and supported by a number of concept notes for umbrella projects which have been formulated to strengthen the implementation of the policy, are outlined in appended Part 3 of the National Policy and Strategy for Fisheries and Aquaculture Development in Pakistan.

# THE STATUS OF FISHERIES AND AQUACULTURE IN PAKISTAN

## Overview and impetus for change

### *Overview of the current status of fisheries and aquaculture:*

The fisheries sector contributes around 1% to the GDP of Pakistan. Recent FAO data reported that Pakistan's total fish production for 2004 was 5708,804 metric tonnes where 556,993 metric tonnes came from capture fisheries and only 13,557 metric tonnes were produced from aquaculture. Total value of exports for the period 2003-2004 was registered at US\$ 156 millions. Principal export markets are USA, Japan, Sri Lanka, Singapore, the EU and the Gulf States.

More than 471,000 fisherfolk, including 287,000 inland fisherfolk, find employment in the sector, while the secondary sector (fishery products processing, input provision and marketing) provides employment and income to more than 110,000 households (FAO data 2003). Capture fisheries and aquaculture together provide employment for around 1% of the total labour force available in the country.

Regarding fish consumption, for Pakistan, there was very little increase in per capita fish consumption (i.e. the estimate of the total supply available for human consumption divided by the population total) from 1.0 kg in 1961 to 2.3 kg in 2001, while the world average over the same period increased from 9.0 kg to 16.3 kg (FAO, 2004).

Pakistan is endowed with vast aquatic resources, as indicated in Table 1. Freshwater, brackishwater and marine resources could be utilised for aquaculture development as long as economically efficient and environmentally sustainable.

Table 1: Inventory of Pakistan's aquatic resources, by province.

Area in ha	Sindh	Punjab	Balochistan	N.W.F.P	Total
Rivers/ streams	160,000	2,940,000	--	2,408	3,102,408
Canals, drains & abandoned canals	321,340	23,700	--	1,763	346,803
Lakes	110,000	6,700	4,047	6,362	127,109
Dams/ reservoirs	97,000	65,800	6,070	26800	195,670
Waterlogged areas	3,000,000	30,000	--	1,600	3,031,600
Deltaic area	700,000 *	--	--	--	700,000
Flood water area	1,000,000	--	--	--	1,000,000
Fish farms **	49,170	10,400	100	560	60,230
Territorial Marine Waters (km)	352 km x 12 N.Miles	--	1,129 x 12 N.Miles	--	1,481 x 12 N.Miles

Source: DOF GOP

\* WWF-Pakistan

\*\* areas of fish farms are likely to be underestimated as many farms are not registered and no inventory system exists.

Concerning aquaculture production, most of the freshwater production comes from the farming of carps. Trout culture is also developing.

### ***Challenges:***

Since 1998, overall fish production has decreased by nearly 2 percent per year. Although this downward trend may be attributed mainly to the marine capture sector, inland freshwater resources of NWFP, Northern Areas and Balochistan are exploited below potential, with low productivity and high poverty levels encountered amongst inland fishing communities. Despite its endowment in natural resources, Pakistan ranks 28<sup>th</sup> among fishing nations in terms of production, and 50<sup>th</sup> in terms of export earnings. Addressing lack of land, seed, feed and technology for aquaculture production are necessary steps, along with addressing post-harvest losses and improving hygiene conditions which reduce the marketability of fish products and are one of the main constraints to export earnings. In addition to the supply of sub-optimal quality fish products on domestic markets, consumers' awareness of the benefits linked to increased fish consumption needs raising. Finally, institutional weaknesses in and outside the fisheries sector, and inadequate capacity of its stakeholders need to be rectified in priority to ensure that both fisheries and aquaculture develop sustainably and in harmony with other sectors of the economy, while receiving the support they need to do so.

### ***Government's impetus for change:***

Over recent years, the fisheries and aquaculture sectors have been gaining an increasing importance in the development policies of the country. The recently (2004) approved Poverty Reduction Strategy Paper (PRSP) of Pakistan, emphasizes the significant role of the fisheries sector in the national economy and for food security of the country. The PRSP proposes to address the issue of rural poverty through the accelerated distribution of state-owned land to small farmers, which is of importance to aquaculture development as land availability is an important constraint. Eighty one percent of the farmers have less than 5 hectares available for their activities.

The President's Agricultural Relief Package also states that fish culture will be promoted in the areas of Sindh where salinity levels make land unsuitable for crops but suitable for aquaculture.

As indicated in GOP's *Ten Year Perspective Development Plan 2001-11*, agricultural development during the next decade will focus on producing high-value crops, fisheries, livestock and dairy products for export and on supplying raw materials to agro-industries.

During the Pakistan Development Forum 2005 held on April 26<sup>th</sup> of the same year, the fisheries sector was highlighted a number of times. The *Prime Minister's speech* during the Inaugural Session of this meeting quoted "... we are also endeavouring to make our livestock and fisheries sectors more dynamic, vibrant, and competitive with industrial bases and marketing to exploit their full potential... to build on excellent linkages with Iran, Afghanistan, Central Asia and Gulf States...". In the same forum, fisheries was identified under the SME sector Phase II development and shrimp farming was declared as one of the major activity under the Value Chain Progress during a presentation at the Pakistan Development Forum 2005<sup>1</sup>.

All of the above indicate the strong interest and willingness of the government to support the development and enhancement of production from the fisheries and aquaculture sectors.

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<sup>1</sup> <http://siteresources.worldbank.org/PAKISTANEXTN/Resources/293051-1114424648263/SessionII-Salman.pdf>

# POLICY FOR FISHERIES AND AQUACULTURE DEVELOPMENT IN PAKISTAN

In light of the constraints to address for Pakistan and its people to reap the benefits from fisheries and aquaculture development, of the immense potential of both sectors and past neglect in agricultural development and planning efforts, the Government of Pakistan (GOP) has decided to give the sector the attention it deserves. To do so, and through a consultative process, it has decided upon three policy goals for fisheries and aquaculture. It has also agreed on a number of guiding principles, and has identified key players and monitoring indicators.

## *The Government's three policy goals:*

The three policy goals that the Government of Pakistan has set to achieve are to:

**1. Increase the contribution of the fisheries and aquaculture sectors  
to national economic growth**

**2. Increase the contribution of the fisheries and aquaculture sectors to poverty alleviation**

**3. Increase the contribution of the fisheries and aquaculture sectors to food security**

Fish and other aquatic products are now recognised as being commodities of high importance in the economies, livelihoods and diets of many South Asian countries.

Fisheries contributes to **national economic growth** in many countries where comparative economic advantage is derived from appropriate ambient conditions and/or favorable input, labor and processing costs and facilitating administrative arrangements underlying efficient production, distribution, export and quality assurance.

With regards to the second goal of **poverty alleviation**, the United Nations World Summit on Sustainable Development 2002, the 2000 World Development Report published by the World Bank, the UN Millennium Declaration adopted in 2000<sup>2</sup>, and the 1996 UN World Food Summit, all considered poverty alleviation as a central priority. While past development interventions in fisheries were often implicitly aimed at reducing poverty, most were not explicitly focused on improving the living conditions of the poor. Rather, they aimed to accelerate economic growth solely through technology and infrastructure development and through market-led economic policies. The lack of an explicit focus on poverty and the inequitable distributional impacts of development programmes may explain the ineffectiveness of many fishery development interventions. As specifically mentioned, the policy goal of poverty alleviation requires consideration of the distributional benefits arising from the sector. Furthermore, poverty alleviation encompasses the dual goals of both poverty *reduction* (i.e. wealth generation and capital accumulation lifting people out of poverty) and poverty *prevention* (i.e. reducing risks and

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<sup>2</sup> The Millennium Declaration contains the commitment to halve, by the year 2015, the proportion of the world's population whose income is less than one dollar a day

increasing safety net functions to reduce vulnerability). Poverty alleviation is thus an inclusive term encompassing both poverty reduction and poverty prevention (and vulnerability reduction) which the strengthening and development of fisheries and aquaculture can address.

With regards to the third policy goal **food security**, at an international conference on the Sustainable Contribution of Fisheries to Food Supply held in Kyoto, Japan in 1995, the 95 participating states approved a Declaration and a Plan of Action to enhance the contribution of fisheries to human food supply. The 1996 World Food Summit stressed the connection between food security and the need for sustainable management of natural resources. The 2002 World Summit on Sustainable Development also focused on food security as a key issue and reiterated a global commitment to responsible fisheries.

### ***The Government's guiding principles:***

To achieve these three policy goals, MINFAL has to recognise the need to work in collaboration with other ministries to address broader concerns than those pertaining only the fisheries and aquaculture sectors. Most fishing communities (inland and coastal) are found to live in extreme poverty conditions and have limited access to resources, such as natural, financial, physical and human capital. This situation is exacerbated by exogenous factors such as water pollution, controversial management practices of inland and coastal fisheries and high costs of inputs for aquaculture activities, which, all combined, hinder the potential for livelihood diversification and overall quantities of fish produced. By simultaneously and adequately targeting the needs of poor communities, as well as those of the private sector and foreign markets and investors, fisheries and aquaculture can be changed into dynamic sectors to simultaneously achieve the Government's three policy goals of economic growth, poverty alleviation and food security.

In agreeing to these three policy goals and the implementation of the necessary strategy to achieve them, the Government of Pakistan has also committed itself to respect principles of:

- good governance, transparency in decision-making and finance management,
- fairness and equity,
- respect of international treaties, laws and commitments,
- participation of all groups and stakeholders, including women, in decision-making processes,
- sustainable environmental resource use, management and protection.

### ***Roles of the three major stakeholder groups:***

#### **Government of Pakistan:**

In addition, in its position of *facilitator* and *regulator*, the Government of Pakistan's role will be to:

- create a suitable and enabling environment to allow private sector initiatives to thrive while protecting the interests of the most vulnerable groups,
- establish the necessary institutions and enhance human capabilities to implement the present policy and support the overall development of the fisheries and aquaculture sectors,
- ensure coherence among measures adopted for the fisheries and aquaculture sectors with those in place in other sectors of the economy, in particular livestock and agriculture.

#### **Private sector:**

As a key partner to the Government in the development of the fisheries and aquaculture sectors, the private sector will:

- shape the future growth of the fisheries, and in particular aquaculture, sectors, in terms of output and value,
- be sustainable *vectors* of economic and social development at community, district and Provincial/Areas levels.

Producers' organisations:

Supporting private sector's interests, producers' organisations will:

- build the necessary institutions for the representation of fishermen and fish farmers at the Provincial/Areas and national levels,
- be a force for collective access to knowledge, information and inputs
- influence the overall development of the fisheries and aquaculture sectors.

***Key indicators of progress:***

Key measurable indicators of progress towards the achievement of the three policy goals of national economic growth, poverty alleviation and food security, will include:

- higher per capita fish consumption
- improved fishers' and fish-farmers' incomes
- creation of well-paid employment in the fisheries and aquaculture sectors
- increased export earnings from aquatic products.

# STRATEGY

## TO INCREASE NATIONAL FISH SUPPLY BASED ON SUSTAINABLE PRODUCTION AND IMPROVED MARKETING OF AQUATIC PRODUCTS

To achieve the three policy goals outlined above, the Government's underlying *strategy* is to **increase national fish supply based on sustainable production and improved marketing of aquatic products.**

The targeted production growth rate for the overall sector (including capture and culture, from marine and inland areas) has been established at 10% per annum. This target corresponds to the extra production needed to increase fish consumption from 1.2kg to 5kg per capita per year. Although it is unlikely that capture fisheries can grow at such a pace, it is estimated that most of the production increases will come from aquaculture, from both inland and coastal areas.

Although the policy timeframe, in coherence with the country's development policies, has a long-term horizon to 2025, the strategy and its implementation plan (next section) have a timeframe of 10 years to kick-start fisheries and aquaculture activities and ensure that sustained levels of production are reached to achieve the 10% annual growth target envisaged. The present strategy (and its implementation plan) should be re-evaluated and, if need be, re-oriented, according to the progress made towards the policy goals and the needs of the sectors at the end of this period.

### *Four fundamental common elements:*

The achievement of the strategy objective, to increase national fish supply based on sustainable production and improved marketing of aquatic products, rest first and foremost on the establishment of a **conducive environment** that will create suitable conditions for sustainable production and improved marketing to take place. This conducive environment will be created through the realisation of **four fundamental "common elements"**, or cross-cutting pillars supporting for the overall development of both fisheries and aquaculture. They are:

#### Common elements

**A. Strengthening of cross-sectoral collaborations.**

**B. Institutional improvements and developments.**

**C. Enhancement of research and development applied to fisheries and aquaculture**

**D. Development of human resources and skills**

"Common elements" refers to the fact that these four items underlie and are prerequisites to the realisation of the three technical strategy axes presented hereafter.

***Three strategy axes:***

Simultaneously, and within the conducive environment created by the realisation of the four fundamental common elements, sustainable production and improved marketing will be achieved through **three strategy axes** which are:

**Strategy axes**

- 1. Sustainable development of inland and coastal aquaculture production**
- 2. Sustainable increase in inland and marine capture fisheries production**
- 3. Resolving post-harvest issues**

Whilst common elements strive to create an enabling environment, the strategy axes relate to technical directions covering the development of inland and coastal aquaculture, marine and inland capture fisheries, and resolving of post-harvest issues. Strategy axis #3 deals specifically with the handling, storage, value-adding/processing, transport and marketing/commercialisation of captured and cultured species.

Figure 1 outlines the structure of the strategy and introduces the objectives of the Plan for the fulfilment of each axis and element.

**Policy goals**

1. Contribution to national economic growth, 2. poverty alleviation, 3. food security

**Strategy objective**

Increase national fish supply based on sustainable production and improved marketing of aquatic products

**Strategy axes**  
(1a, 1b, 2a, 2b, 3)

1. Sustainable development of aquaculture production

2. Sustainable increase in capture fisheries production

3. Resolving post-harvest issues of captured and cultured species

*Outline of plan objectives (PO)*

**1A – Strengthening of inland aquaculture production**  
*PO 1A.1: Develop high potential zones for inland aquaculture.*  
*PO 1A.2: Attract private sector investment in inland aquaculture production.*  
*PO 1A.3: Encourage the production of aquatic species able to compete on domestic and international markets.*  
*PO 1A.4: Ensure that environmental concerns are fully taken account in inland aquaculture development.*

**1B – Development of aquaculture in coastal areas**  
*PO 1B.1: Develop high potential zones for coastal aquaculture.*  
*PO 1B.2: Attract private sector investment in coastal aquaculture production.*  
*PO 1B.3: Facilitate the establishment of the culture of shrimp, finfish and mud crab in coastal areas of Sindh and Balochistan.*  
*PO 1B.4: Ensure that environmental concerns are fully taken account in coastal aquaculture development.*

**2A – Marine capture fisheries**  
*PO 2A.1: Rehabilitate marine aquatic habitats damaged by pollution and environmental degradation.*  
*PO 2A.2: Control over-exploitation of marine resources.*  
*PO 2A.3: Promote sustainable management of marine aquatic resources.*  
*PO 2A.4: Establish sustainable harvesting and utilisation of untapped marine resources.*  
*PO 2A.5: Promote fisherfolks' safety at sea.*  
*PO 2A.6: Promote sport fishing activities in coastal waters.*

**2B – Inland capture fisheries**  
*PO 2B.1: Rehabilitate inland aquatic habitats damaged by pollution and environmental degradation.*  
*PO 2B.2: Control over-exploitation of inland fisheries resources.*  
*PO 2B.3: Promote sustainable management of inland aquatic resources.*  
*PO 2B.4: Establish sustainable exploitation of untapped inland resources.*  
*PO 2B.5: Promote sport fishing activities in inland water bodies.*

*PO 3.1: Improve the handling and preservation of fish and aquatic products.*  
*PO 3.2: Add value (transformation/processing) to aquatic products.*  
*PO 3.3: Improve transportation of aquatic products.*  
*PO 3.4: Improve commercialisation of aquatic products.*  
*PO 3.5: Improve access of aquatic products to international markets.*  
*PO 3.6: Improve dissemination of market and product information.*

**Strategy common elements**  
(A, B, C, D)

*Outline of plan objectives (PO) (activities not detailed here)*

**A. Strengthening of cross-sectoral developments**  
*PO A1: Establish strong partnerships to attract private investment in aquaculture (inland and coastal) and post-harvest activities*  
*PO A2: Increase coordination of multiple uses of freshwater (surface and underground)*  
*PO A3: Establish strong collaborative partnerships and processes to ensure adequate and sustainable water flows in major rivers and tributaries and re-establish balanced water regimes/uses and ecosystems*  
*PO A4: Support wide-ranging livelihood needs in fishing communities*  
*PO A5: Implement integrated coastal area management and reduce resource conflict occurrence and environmental degradation in coastal areas*  
*PO A6: Promote environmental conservation and adopt measures to prevent damage to aquatic biodiversity by pollution and environmental degradation*

**B. Institutional improvements and development within the fisheries and aquaculture sectors**  
*PO B1: Strengthen current fisheries institutions through a better demarcation of roles and responsibilities*  
*PO B2: Reform/re-organise Provincial/Areas and district authorities and existing institutions*  
*PO B3: Support the formation of producers' organisations*  
*PO B4: Study and reform the existing contract system for the exploitation of freshwater bodies*  
*PO B5: Address current fisheries and aquaculture legislation and regulations shortcomings*  
*PO B6: Recognise and promote the role of communities in fisheries management in coastal and inland areas*

**C. Development of human resources and skills**  
*PO C1: Provide fisheries and aquaculture training programmes and suitable training facilities*  
*PO C2: Improve extension services for the fisheries and aquaculture sectors*

**D. Enhancement of research and development applied to fisheries and aquaculture**  
*PO D1: Enhance support to and improve quality and relevance of research and development applied to fisheries and aquaculture*  
*PO D2: Develop and support technical research programmes*  
*PO D3: Increase the reliability of fisheries and aquaculture statistical data country-wide*  
*PO D4: Monitor and ensure that social, economic, marketing and institutional issues are adequately dealt with in relation to fisheries and aquaculture development*

## **IMPLEMENTATION PLAN**

### **FOR THE FISHERIES AND AQUACULTURE POLICY AND STRATEGY**

This section of the policy document describes the objectives, and related actions necessary to implement the policy. They are listed under each identified ‘common element’ and ‘axis’ of the strategy. As such, the implementation plan constitutes the “flesh on the bones” of the strategy. Each common element, and each strategy axis, set to achieve a number of specific objectives (the “plan objectives” – PO) to address issues and shortcomings that have impeded the development of fisheries and aquaculture in Pakistan. Such problems are outlined at the outset of each section.

Several actions/activities are then needed to achieve the plan objectives. They constitute the concrete steps towards the implementation of the overall strategy, and are thus called “activity towards plan objective” – APO. They are presented hereafter and should be seen as the coherent approach and concrete steps to follow to implement the policy.

Details regarding each activity (or APO), i.e. identification of partnerships to form, timeframes for completion, potential sources of funding, are presented in tabular format at the end of this section. The “matrices” form the core of the implementation plan should be used as guidelines by all those who will be involved in the implementation of the policy, as well as a monitoring tool to ensure that progress is made towards the achievement of the plan objectives, and ultimately the policy goals.

The creation of a policy implementation body, identified as a requirement to ensure the implementation of the following activities, is outlined in Part 2 of the policy document.

*1) Plan objectives and activities for each common element and axis of the strategy*

**COMMON ELEMENT A:**

**STRENGTHENING OF CROSS-SECTORAL COLLABORATIONS**

***Major problems and constraints to address:***

*Weak inter-agency coordination*

Inter-agency coordination is weak, and at times conflictual. In addition to the decreasing capacity of the government to directly support and finance aquaculture production, this has deterred investment in the aquaculture sector by private entrepreneurs. It has further prevented the implementation of successful measures to alleviate poverty in inland and coastal fishing communities where coordinated efforts towards improved fisheries management, livelihood diversification through aquaculture and the provision of basic infrastructure and livelihood support services are necessary.

*Reduction in flow of River Indus and its tributaries*

Influx of freshwater from the River Indus is known to be a major contributor towards the productivity of estuarine areas of Sindh, as well as in offshore waters. Overall reduction in the flow of the River Indus over recent decades has negatively affected fisheries in estuarine areas of Pakistan. The production of commercially important species such as river shad ‘palla’, barramundi ‘dangri’ and Indian threadfin ‘rawans’ has decreased substantially in the past four decades and has resulted in socio-economic hardships in coastal communities and in increased pressure on other natural resources, in particular mangroves, which as a consequence, are exploited unsustainably for alternative sources of income. The intrusion of sea water in the absence of, or reduction in, flow from the Indus River has taken place and has had serious impacts on the production of important fish species, as well as on agriculture and other economic activities. Some of the highly productive estuarine fishing grounds have been converted into saline lagoons where productivity of commercially important species is now minimal.

Reduction in the downstream flow below large dams and barrages has also affected water regimes and inland fauna, including fisheries, despite the diversion of water to create additional habitat for the freshwater fishes in some areas. However, the impact of water diversions and stoppages on some large rivers due to Indus Water Treaty has not been documented.

*Increase in pollution and environmental degradation*

Industrial and urban pollution has been increasing and has started to negatively affect both inland and coastal waters. Environmental degradation due to habitat destruction, land reclamation, mangrove cutting and other factors has also affected the natural productivity of coastal fisheries, in particular in Sindh. Pollution has also increased in inland water bodies throughout the country, especially in the vicinity of large populations and industrial centres.

Addressing cross-cutting issues affecting fisheries and aquaculture development in Pakistan such as lack of private investment, competitive uses and depletion of freshwater resources, poverty in fishing communities, and environmental degradation, can only be done effectively through partnerships and collaborations with institutions other than those dealing directly with fisheries and aquaculture development.

***Implementation plan objectives and activities to address these constraints:***

**Plan objective (PO) A.1: Establish strong collaborative partnerships to attract private investment in aquaculture (coastal and inland) and post-harvest activities.**

*On financial and investment-related matters, activities towards this plan objective (APO) are:*

A.1.1 Involve the private sector in fisheries and aquaculture projects developed by the Fisheries Depts, where necessary.

A.1.2 Consult relevant ministries and banks regarding the provision of financial incentives to attract foreign investment in fisheries (seed and feed production, grow-out and post-harvest operations).

A.1.3: Consult relevant ministries and banks for the development of matching grant, microfinance, interest-free and soft loan schemes to attract private entrepreneurs in production, post-harvest transformation and marketing, and other ancillary activities.

A.1.4 Consult relevant ministries regarding the revision of the current income tax imposed on fishing and fish farming operations.

A.1.5 Maintain and simplify duty-free import incentives on fishing and fish farming equipment and machinery.

A.1.6 Implement insurance schemes for fishermen and fish farmers.

*On export and trade-related matters, activities are:*

A.1.7 Establish Exclusive Fish Export Zones (EFEZ) in key locations.

*On technical matters, activities are:*

A.1.8 Negotiate the restoration of single-phase electricity connection to fish farmers and the installation of new main electricity connection lines and transformers at preferential rates.

*On land-related matters, activities are:*

A.1.9 Engage in discussions to ensure that a rational approach be adopted for assessing the value of land (at prevailing market value) and that waste land be identified for long-term private leasing for aquaculture development.

A.1.10 Study and negotiate the possibility to allow small-scale land farmers to use the government land lease they currently have access to for agricultural purposes, for aquaculture on a long term basis.

**Plan objective (PO) A.2: Increase coordination of multiple uses of freshwater (surface and underground).**

A.2.1 Ensure that aquaculture is taken account of in future plans for investment in irrigation, irrigated agriculture and related infrastructures.

A.2.2 Establish a joint Committee composed of representatives of all Ministries dealing directly and indirectly with freshwater use.

A.2.3 Jointly engage in discussions and planning with other Ministries on priority uses, protection, sustainable development and increased productivity of freshwater resources.

**Plan objective (PO) A.3: Establish strong collaborative partnerships and processes to ensure adequate and sustainable water flows in major rivers and tributaries and re-establish balanced water regimes/use and ecosystems.**

A.3.1 Ensure that interests from the Fisheries Depts are taken into account in water allocation.

A.3.2 Partake in the decision-making process concerning the reclamation and rehabilitation of areas affected by salinity.

A.3.3 Partake in the decision-making process concerning the implementation of drainage measures.

A.3.4 Monitor the impact of water diversions on habitats and livelihoods, and develop guidelines for the mitigation of negative impacts.

A.3.5 Partake in the decision-making process concerning the increase in water diversions to recreate habitats.

A.3.6 Advocate for the implementation and enforcement of effluent water treatments (including recycling for agricultural purposes) by all industries in urban areas.

A.3.7 Negotiate freshwater supply to fish farms at critical times.

**Plan objective (PO) A.4: Support wide-ranging livelihood needs in fishing communities.**

*In relation to developing community infrastructures and facilities, activities towards this plan objective (APO) are:*

A.4.1 Assess, plan and develop community infrastructures and facilities supporting overall livelihoods.

A.4.2 Reclaim land in the Baba and Bhit Islands, and Shamspear area to develop livelihoods facilities (school, hospital and shrimp peeling sheds).

*In relation to diversification of income generating activities and employment creation, activities are:*

A.4.3 Support literacy, vocational training and other educational programs in fishing communities.

A.4.4 Support alternative and/or complementary livelihood activities in fishing communities through increasing access to credit and savings schemes and the provision of micro-finance initiatives.

A.4.5 Promote the participation of women, and benefits from their involvement, in aquaculture, post-harvest and other livelihood activities.

A.4.6 Advocate for the allocation of marginal land for agricultural use to fishing communities who are affected by water diversion/limited release of water in the River Indus.

*In relation to social protection and wellbeing, activities are:*

A.4.7 Support attempts by fishing communities to gain security of land and housing rights.

A.4.8 Advocate for the fisheries sector to be considered under the old age benefit scheme.

A.4.9 Impose a levy on all aquaculture projects covering more than 50 ha to be paid towards a social development fund for the local population.

**Plan objective (PO) A.5: Implement integrated coastal area management and reduce resource conflict occurrence and environmental degradation in coastal areas.**

A.5.1 Increase coordination and cooperation among multiple users of coastal resources (land, water, forest).

A.5.2 Engage in, and support, fisheries interests in all coastal area planning and management processes through a mechanism for cross-sectoral integration and participatory decision-making.

A.5.3 Develop a coordinated mechanism for monitoring and ensuring compliance of legislations pertaining to non-fisheries related coastal resources such as mangroves, turtles etc.

A.5.4 Formulate and implement an integrated coastal zone management (ICZM) plan for the Indus estuary and other coastal areas.

**Plan objective (PO) A.6: Promote environmental conservation and adopt measures to prevent damage to aquatic biodiversity by pollution and environmental degradation.**

A.6.1 Evaluate existing laws and their appropriateness in reducing pollution and environmental degradation and lobby Ministry of Law for making necessary changes and assist in the formulation of new laws for land-based pollution sources.

A6.2 Establish wetland reserves.

## **COMMON ELEMENT B:**

### **INSTITUTIONAL IMPROVEMENTS AND DEVELOPMENTS WITHIN THE FISHERIES AND AQUACULTURE SECTORS**

#### ***Major problems and constraints to address:***

##### *Inadequate institutions:*

With the exception of Punjab, and to a lesser extent Balochistan, Provincial/Areas Fisheries Depts are not properly manned nor organized, in particular at district levels. Mandates, hierarchies and responsibilities in these organizations are not well defined, nor well known, while some institutions which could enhance the development of fisheries and aquaculture within the wider economy are simply lacking. Internal conflicts linked to institutional dis-functioning have prevented fisheries management and aquaculture development to receive the attention they require. The lack of producers' organisations, in particular in relation to aquaculture, is slowing down the development of the sector and hampering information sharing and concerted action. The lack, if not non-existence, of fisheries management schemes organised and managed by communities is also an institutional weakness that could be rectified through adequate devolution of responsibilities for sustainable inland and coastal fisheries resources management and use.

##### *Controversial contract system in freshwater bodies:*

Major freshwater bodies are under the control of various government bodies. These agencies annually auction the harvesting of fish from such water bodies. Contractors giving the highest bids are authorized to harvest the fish from these water bodies and hire fishermen for the purpose. Some fishermen's groups and NGOs criticise this system as being exploitive, and have been campaigning for its abolition and introduction of licensing arrangements. While there are pros and cons for both the systems, the case for abolition raises the need for an unbiased assessment of various management possibilities.

##### *Legislation shortcomings:*

Although some legislation is in place, it is often not well enforced. This applies for example to the use of illegal fishing gear with ineffective legislation and a lack monitoring and surveillance support facilities failing to prevent the spread of some of these fishing methods, and has resulted in significant declines in stocks of commercially important species.

Institutional developments and improvements are also paramount to ensure the effective and efficient implementation of the present policy and strategy. The establishment of a Fisheries and Aquaculture policy implementation cell is a step in this direction.

#### ***Implementation plan objectives and activities to address these constraints:***

##### **Plan objective (PO) B.1 [priority]: Strengthen current fisheries institutions, through a better demarcation of roles and responsibilities.**

B.1.1 Strengthen Provincial/Areas and District Fisheries Depts' role in implementation and monitoring of fisheries management measures.

B.1.2 Increase awareness among the government hierarchy on the need for properly functioning institutions to support fisheries and aquaculture development.

- B.1.3 Carry out a full institutional assessment of government staffing levels and skill sets against needs/requirements for sectors' management and development.
- B.1.4 Increase, and/or relocate, staff across institutions for improved efficiency.
- B.1.5 Improve communications among private sector players and organizations involved in fisheries and aquaculture management and development.
- B.1.6 Clearly specify and publicize responsibilities of federal, Provincial/Areas and district fisheries authorities and their activities linked to the development and management of marine/inland fisheries, and coastal/ inland aquaculture.
- B.1.7 Ensure participation of all groups and stakeholders, including women, in devolution, bottom-up and transparent decision-making processes pertaining to fishing and aquaculture.

**Plan objective (PO) B.2: Reform/ reorganize Provincial/Areas and district authorities and existing institutions to make them more responsive to the needs of fisheries/aquaculture development and management.**

- B.2.1 Broaden the responsibilities of the Marine Fisheries Department to include regulatory powers concerning importation of fish in the country.
- B.2.2 Limit the role of District governments to the provision of extension services and place training and hatchery operations (for demonstration) under the responsibility of the Provincial/Areas Fisheries Depts.
- B.2.3 Place the control of all natural fisheries resources/public water bodies under the responsibility of Provincial/Areas Fisheries Depts (and not with Forest Depts).

**Plan objective (PO) B.3: Support the formation of producers' organisations**

- B.3.1 [priority]: Promote the formation of associations, societies and cooperative organizations of fishermen and fish farmers for collective problem solving.
- B.3.2 Promotion of cooperative arrangements for the establishment of transportation and marketing facilities.

**Plan objective (PO) B.4: Study and reform the existing contract system for the exploitation of freshwater bodies.**

- B.4.1 Carry out a study of the merits and disadvantages of both the contract and license systems prior to taking further actions.
- B.4.2 Replace the existing contract system with a more appropriate system of exploitation of inland waters, if found suitable in the study carried out under APO B. 4.1.
- B.4.3 Ensure that all fishermen are officially registered.

**Plan objective (PO) B.5: Address current fisheries and aquaculture legislation and regulations shortcomings.**

- B.5.1 Revise current fisheries legislation and make amendments, as appropriate, to support the implementation of the present fisheries and aquaculture policy and strategy and minimize conflicts over fisheries resources.
- B.5.2 Design new/updated legislation and regulations with respect to the maintaining of aquatic species gene pools and genetic diversity and the prevention of trans-boundary movements of fish in aquaculture.
- B.5.3 Liaise with Environment Protection Agencies over environmental management regulations to control pollution in inland and coastal waters.
- B.5.4 Support non-fisheries specific legislation such as laws relating to human rights, migration and access to social security, workers rights under IRO (Industrial Relation Ordinance) and decentralization to be put in place simultaneously.
- B.5.5 Establish special fisheries courts and magistrates to deal with fishing-related offences.

B.5.6 Ensure that compulsory environmental impact assessments (EIA) are carried out prior to all investments in coastal aquaculture operations, and major fisheries and coastal development schemes.

B.5.7 Enhance inter-ministry/department collaboration and staff dedicated to control IUU fishing.

**Plan objective (PO) B.6: Recognise and promote the role of communities in fisheries management in coastal and inland areas.**

B.6.1: Devolve fisheries management responsibilities to inland and coastal fishing communities.

B.6.2 Provide special support to strengthen community-based fisheries and representative organizations, in particular in relation to the management of fisheries resources.

B.6.3 Institutionalize consultation mechanisms between opposing interest groups to find common and acceptable solutions.

B.6.4 Improve communication linkages with coastal areas and establish tsunami and cyclone warning and prevention centers in coastal areas.

B.6.5 Implement a programme designed by SCDA for the integrated development of the Indus Delta and related estuarine zone.

## **COMMON ELEMENT C:**

### **DEVELOPMENT OF HUMAN RESOURCES AND SKILLS**

#### ***Major problems and constraints to address:***

Inadequate human resources and skills are found at two levels: within government structures, and within fishing and fish farming communities. In most cases, fisheries institutions are inadequately staffed. Lack of trained manpower and suitable facilities in fisheries and aquaculture management organizations and research institutions are considered to be one of most important impediment to the development of both fisheries and aquaculture. This has consequences in terms of both the quality and the relevance of extension work carried out at the field level, with weak knowledge and experience being passed on to fisherfolks and fish farmers.

#### ***Implementation plan objectives and activities to address these constraints:***

#### **Plan objective (PO) C.1: Provide fisheries and aquaculture training programmes and suitable training facilities.**

- C.1.1 Reactivate the training program at Fisheries Training Centre in Karachi and Chilya (Sindh).
- C.1.2 Establish a fisheries training centre in Gwader and Dera Murad Jamali on fisheries and aquaculture disciplines (Balochistan).
- C.1.3 Establish an aquaculture training centre at Naran, Abbagogon, Gujranwala, and Muzafargarh, and strengthen training facilities at Madyan for promotion of trout culture (NWFP).
- C.1.4 Strengthen technical expertise of the staff of the Fisheries Depts through participation in regular skills development courses and training programs.
- C.1.5 Start university degree programs specific to fisheries sciences, fisheries management and aquaculture management.
- C.1.6 Develop training modules for sustainable fisheries practices for building capacities and skills for sustainable management of ecosystems at all levels.
- C.1.7 Broaden the range of topics covered in training programs to make them more relevant, effective and practical.
- C.1.8 Establish a system of certification of training courses and programs at national level to ensure that only certified staff be employed in the fisheries and aquaculture sectors, in particular in processing factories.
- C.1.9 Ensure that opportunities for study tours abroad are provided to trainees as part of training on fisheries and aquaculture.
- C.1.10 Ensure that training courses on the culture of ornamental species and improved fishing methods, including net making, are designed and targeted at women.
- C.1.11 Propose to Education Departments that fisheries and aquaculture-related subjects are included in primary and secondary curricula in areas of high fisheries production potential, or where livelihoods depend strongly on the sector.
- C.1.12 Prepare training materials and technical documentation for training at various levels in Urdu and other local languages.
- C.1.13 Ensure equal access and opportunities to men, women, disabled and minorities in accessing training, skill enhancement programs and extension activities.
- C.1.14 Improve lodging and boarding facilities at training centers.

**Plan objective (PO) C.2: Improve extension services for the fisheries and aquaculture sectors.**

- C.2.1 Where required, improve existing, and establish new mobile extension units at Tehsil level.
- C.2.2 Raise awareness among fishermen and fish farmers about conservation and sustainable management principles.
- C.2.3 Broaden the range and relevance of topics for extension to fish farmers and fishermen.
- C.2.4 Educate and train fish traders on the use of improved fish transportation methods.

## **COMMON ELEMENT D:**

### **ENHANCEMENT OF RESEARCH AND DEVELOPMENT APPLIED TO FISHERIES AND AQUACULTURE**

#### ***Major problems and constraints to address:***

##### *Inadequacy in the research and development sector:*

Although a number of research organizations, institutions and universities include fisheries and aquaculture-related subjects in their agendas, most of the research conducted to date has had little relevance to practical aspects and concerns of those in the fisheries and aquaculture industries. Adequate research support is needed for development of the sector to happen.

##### *Inadequacies in fisheries and aquaculture statistical data:*

Fisheries and aquaculture information in Pakistan faces problems of inadequacy, reliability and accuracy. For example, there are some inadequacies in the data collection system in Balochistan linked to poor sampling methods along the coast, whilst no reliable data collection system exists in other provinces. In most cases, fisheries data from Sindh are merely estimates and prone to personal judgments resulting in unreliable data. Inadequacies in the statistical fisheries and aquaculture data collection system make the management of aquaculture, and inland and marine fisheries resources very difficult.

#### ***Implementation plan objectives and activities to address these constraints:***

##### **Plan objective (PO) D.1: Enhance support to and improve quality and relevance of research and development applied to fisheries and aquaculture.**

D.1.1 Create an independent Fisheries Research Council for marine and inland fisheries and aquaculture research.

D.1.2 Initiate (where needed), support and strengthen applied research in academia and research institutions with redefined research agendas matching fisheries and aquaculture development needs.

D.1.3 Increase and target better funding to research centres and institutes involved in fisheries and aquaculture-related research.

D.1.4 Revamp and update existing university curricula to include conduction of research methods/projects relevant to fisheries and aquaculture sectors' needs.

D.1.5 Establish linkages with international research institutes/universities for research and collaborative programs on fisheries and aquaculture.

##### **Plan objective (PO) D.2: Develop and support technical research programmes.**

D.2.1 Investigate the potential of introducing pearl, bivalve and oyster culture and sea ranching.

D.2.2 Establish fish disease diagnostic laboratories and services in Gwader HPZs around the country.

D.2.3 Start a programme for genetic improvement of fish species and hybrids under strict control and regulations.

**Plan objective (PO) D.3: Increase the reliability of fisheries and aquaculture statistical data country-wide.**

D.3.1 Implement a comprehensive and harmonized data collection and analysis systems across provinces coordinated by Fisheries Depts at Provincial/Areas level, with reporting to the Federal Bureau of Statistics.

D.3.2 Strengthen the capacity for collection in Provincial/Areas Fisheries Depts and analysis of statistical data in the FBS.

**Plan objective (PO) D.4: Monitor and ensure that social, economic, marketing and institutional issues are adequately dealt with in relation to fisheries and aquaculture development.**

D.4.1 Promote the inclusion of social, economic, marketing and institutional subjects in all fisheries and aquaculture research and training programmes.

D.4.2 Recruit economists and social scientists in Provincial/Areas Fisheries institutions /departments

D.4.3 Ensure that livelihoods and welfare of fishing communities are covered in baseline studies and are monitored over time.

D.4.4 Ensure that the environmental, social and economic impacts of aquaculture development towards commercially-oriented operations are regularly monitored.

## **STRATEGY AXIS 1:**

### **SUSTAINABLE DEVELOPMENT OF AQUACULTURE PRODUCTION (INLAND AND COASTAL)**

#### **Strategy axis (SA) 1A: Strengthening of inland aquaculture production.**

##### ***Major problems and constraints to address:***

Although remarkable progress has been made in the field of aquaculture in Pakistan, especially in Punjab, the sector still faces important impediments related to: i) inadequate availability of freshwater in some areas, in particular in lower Sindh, and decreasing groundwater levels which make it difficult and expensive for fish farmers in areas not fed by rivers and canals; ii) inadequate availability of seed of commercially important fish species, in particular in Sindh where demand is met by transporting seeds from the province of Punjab; iii) competition from imported carps from Myanmar.

##### ***Implementation plan objectives and activities to address these constraints:***

#### **Plan objective (PO) 1A.1: Develop high potential zones for inland aquaculture development.**

1A.1.1 Produce maps of high potential zones (HPZ) at Provincial/Areas and district levels and highlight the X most important zones in the country.

1A.1.2 Assign government specialists only to HPZ: field staff will be assigned to top priority zones on a regular rotation (every 2-5 years), and reassigned to new zones once aquaculture development in a given zone reaches a sustainable level.

1A.1.3 Encourage direct external/internal investment in priority towards these zones; with services and inputs provided in priority within the zones.

1A.1.4 Consider irrigation schemes with suitable infrastructure for aquaculture in zones with high potential (HPZ).

#### **Plan objective (PO) 1A.2: Attract private investment in inland aquaculture production (including fish seed/fingerlings, feed and grow-out).**

1A.2.1 [priority]: Provide appropriate financial incentives to attract the private sector in seed/fingerlings production and grow-out operations of commercially-important freshwater species.

1A.2.2 Establish a registration system for fish farms at Provincial/Areas level.

1A.2.3 Widely publicize nationally and internationally the potential for freshwater aquaculture development in Pakistan.

#### **Plan objective (PO) 1A.3: Encourage the production of aquatic species able to compete on domestic and international markets.**

1A.3.1 [priority #1]: Enhance private sector-led production of seed and grow-out activities for freshwater prawns, catfish and snakehead.

1A.3.2 [priority #2]: Allow priority conversion of waste lands (saline, water-logged) for aquaculture activities.

1A.3.3 Prepare a management plan for aquaculture development on waste lands (saline and water-logged).

1A.3.4 Encourage increased production of highly demanded and high value fish for the domestic and international markets, and focus on the propagation of threatened species with potential for aquaculture.

**Plan objective (PO) 1A.4: Ensure that environmental concerns are fully taken into account in inland aquaculture development.**

1A.4.1 Establish and enforce guidelines and standards regarding the treatment of aquaculture pond effluents prior to release in the environment.

1A.4.2 Promote the adoption of measures to prevent damage to aquatic biodiversity by pollution and environmental degradation.

1A.4.3 Provide inputs in the design indicators for monitoring pollution in water bodies.

1A.4.4 Campaign for industrial and domestic effluents in the vicinity of aquaculture operations to be treated to minimize negative impacts on aquaculture operations.

## **Strategy axis (SA) 1B: Development of aquaculture in coastal areas.**

### ***Major problems and constraints to address:***

Despite several attempts by private and public sectors, aquaculture in coastal areas of Pakistan remains embryonic and generates few export commodities.

### ***Implementation plan objectives and activities to address these constraints:***

#### **Plan objective (PO) 1B.1: Develop high potential zones for coastal aquaculture development.**

1B.1.1 Produce maps of high potential zones (HPZ) at Provincial/Areas and district levels and highlight the X most important zones in the country.

1B.1.2 Direct external/internal investment in priority towards these zones; with services and inputs provided in priority within the zones.

1B.1.3 Lobby to ensure that non-aquaculture developmental activities (especially infrastructure) in HPZ make provision for aquaculture activities.

#### **Plan objective (PO) 1B.2: Attract private sector investment in coastal aquaculture production (including seed/fingerlings, feed and grow-out).**

1B.2.1 [priority #1] Facilitate the lease of land for fish farming under Land Lease Policy along the coast.

1B.2.2 [priority #2] Provide appropriate financial incentives to attract the private sector in production of feed and seed/fingerlings, and manufacturing of fish drugs and medicines.

1B.2.3 Establish a registration system for fish farms at Provincial/Areas level.

1B.2.4 Widely publicize nationally and internationally the potential for coastal aquaculture development in Pakistan.

1B.2.5 Promote environmentally-friendly private sector and NGO uptake of culture of finfish in cages, crab and other lucrative species in HPZ.

#### **Plan objective (PO) 1B.3: Facilitate the establishment of the culture of shrimp, finfish and mud crab in coastal areas of Sindh and Balochistan.**

1B.3.1 [priority]: Assess, reactivate and maintain facilities at Garho in Sindh for training and demonstration purposes (demonstration and pilot activities).

1B.3.2 Establish environmentally-friendly demonstration pilot-scale shrimp farming operations in Balochistan (in identified HPZ).

#### **Plan objective (PO) 1B.4: Ensure that environmental concerns are fully taken into account in coastal aquaculture developments.**

1B.4.1 [priority]: Guarantee the protection of protected and replanted mangroves of coastal areas from aquaculture operations.

1B.4.2 Develop and enforce measures to prevent damage to aquatic biodiversity by pollution and environmental degradation due to aquaculture operations.

1B.4.3 Establish a regular programme for monitoring of pollution in coastal waters.

1B.4.4 Lobby to ensure that no untreated industrial and domestic effluents are released in HPZ (prevention of negative impacts on aquaculture activities).

1B.4.5 Ensure that international guidelines regarding the sustainable collection of wild shrimp larvae and management of environmentally-friendly shrimp farming operations are followed.

1B.4.6 Ensure that Ramsar sites located in the Indus Delta and other coastal areas are not affected by coastal aquaculture developments.

## **STRATEGY AXIS 2:**

### **SUSTAINABLE INCREASE IN CAPTURE FISHERIES PRODUCTION (MARINE AND INLAND)**

#### **Strategy axis (SA) 2A: Marine capture fisheries.**

##### ***Major problems and constraints to address:***

###### ***Over-exploitation of resources:***

Mechanization of the fishing fleet and increased demand of seafood for export and domestic consumption have led to increased fish production. However, inadequately managed, it has added a tremendous pressure on natural stocks. Some of the resources have been depleted, some are currently over-exploited while others are under threat of depletion. Shrimp stocks have been severely over-fished and a major decrease in landings of important shrimp species as well as a major reduction in the size of commercial species is now noticeable. Resources of lobsters have already been over-fished and annual landings have decreased from over 5,000 MT to about 800 MT. Resources of crabs, ivory shells and some fin-fishes have also shown signs of over-exploitation.

No stock assessment survey has been carried out for the last 15 years, and the lack of information on the present status of various resources in shallow and offshore waters makes impossible the implementation of appropriate management measures. In the absence of regular monitoring of the resources, it is not possible to determine appropriate levels of exploitation of commercially important species.

###### ***Use of harmful fishing methods:***

Use of some exotic gears began in the 1970s, when an influx of immigrants from Bangladesh and Myanmar took place in coastal areas of Sindh. Two types of these gears, i.e. encircling net 'katra' and estuarine set bag net 'bullo' are considered extremely harmful to juvenile populations of commercially important species which abound in creek systems. A trawl shrimp net 'gujja' is also used in creek areas. Coastal communities, NGO's, environmentalists and fisheries scientists have long pledged for a ban on the use these fishing gears because of their devastating effects on the local fauna and populations of commercially important species. Ineffective legislation and a lack of monitoring and surveillance facilities have resulted in a failure to prevent the spread of some of these fishing gears to the coast of Balochistan (e.g. Miani Hor), although coastal communities were able to eradicate use of 'bullo' in an operation carried out in April 2006. In Balochistan, there is some resentment on the use of trawl nets by Karachi-based fishing boats. This has resulted in conflicts between fishermen of Sindh and Balochistan. Despite a number of attempts to resolve this issue, including at one stage permitting licenced-trawling in Balochistan, conflicts have not been resolved and poaching by Sindh-based trawlers and 'katra' boats persists.

###### ***Increase in pollution and environmental degradation***

Some fishing grounds along Karachi coast have been badly affected by industrial and urban pollution. The natural productivity of coastal waters in Sindh has been affected by habitat destruction, land reclamation and mangrove cutting.

***Implementation plan objectives and activities to address these constraints:***

**Plan objective (PO) 2A.1: Rehabilitate marine aquatic habitats damaged by pollution and environmental degradation.**

2A.1.1 [priority]: Conserve, replant and improve management of mangroves in coastal areas to protect fish breeding grounds.

2A.1.2 Contribute to the establishment of guidelines and processes for providing compensation by polluters to those affected by pollution based on the polluters pay principle.

2A.1.3 Lobby to ensure that industrial waste and domestic sewage is treated prior to release into marine environments.

2A.1.4 Assess, mitigate and control environmental degradation and pollution on coastal habitats from aquaculture.

2A.1.5 Enforce aquaculture and fisheries-related pollution control legislation in coastal areas.

**Plan objective (PO) 2A.2: Control over-exploitation of marine fisheries resources.**

2A.2.1 [priority]: Control illegal, unreported and unregulated (IUU) fishing in coastal and offshore waters.

2A.2.2 Establish guidelines and promote the use of environmentally responsible fishing practices (following internationally-established codes and standards).

2A.2.3 Control fleet size and fishing capacity.

2A.2.4 Create an exclusion zone for deepsea trawlers in coastal waters.

2A.2.5 Implement a seasonal ban on catching shrimp in coastal areas of Balochistan during the months of May, June and July.

**Plan objective (PO) 2A.3: Promote sustainable management of marine aquatic resources.**

2A.3.1 Conduct resource surveys, species stock assessments in marine (coastal and off-shore) waters.

2A.3.2 Determine and regulate optimal harvesting levels in marine waters.

2A.3.3 Improve fisheries law enforcement as well as monitoring, control and surveillance services.

2A.3.4 Adopt and implement FAO Code of Conduct for Responsible Fisheries (CCRF) and related guidelines including the ecosystems-based approach to fisheries management.

2A.3.5 Initiate a programme of awareness raising targeted at fishing communities and the general population about marine fish bio-diversity, natural fisheries environments, sustainable resource exploitation and conservation.

2A.3.6 Establish artificial reefs along Sindh and Balochistan coast.

2A.3.7 Contribute to the development and implementation of a plan for the restoration of the Indus Delta and associated estuarine habitats.

2A.3.8 Establish a system of regular monitoring of various habitats along the coastline, including mangroves, marine turtles and other aquatic biodiversity.

2A.3.9 Create awareness among fishermen on the environmental degradation and pollution impacts of activities such as catching non-target species and fauna, ghost fishing discards, dumping waste oil and solid materials and bilge cleaning.

2A.3.10 Lobby for a fresh EIA of construction of Mirani Dam on the mangrove habitat and associated ecosystems of Gwater Bay and Jiwani to be conducted.

2A.3.11 Establish protected areas and marine parks along the coast.

2A.3.12 Promote reduction of non-target catch and habitat destruction by fishing and propose recommendations for minimising impacts.

2A.3.13 Sign up to, and comply with, relevant international agreements.

**Plan objective (PO) 2A.4: Establish sustainable harvesting and utilization of untapped marine resources.**

2A.4.1 Promote light fishing and jigging for squids.

2A.4.2 Introduce tuna longline fishing in Pakistan and tuna value-adding processing.

2A.4.3 Introduce trap fishing for various shellfish and finfish.

**Plan objective (PO) 2A.5: Promote fisherfolks' safety at sea.**

2A.5.1 Promote acquisition and use of minimum safety equipment onboard of fishing boats.

2A.5.2 Extend sea search and rescue facilities to all fishing boats along the coast of Pakistan.

**Plan objective (PO) 2A.6: Promote sport fishing activities in coastal waters.**

2A.6.1 Construct a pier and harbour facilities at Goth Mubbarak for sport fishermen.

2A.6.2 Advertise sport fishing and organise regular tournaments under government supervision.

## **Strategy axis (SA) 2b: Inland capture fisheries.**

### ***Major problems and constraints to address:***

#### *Over-exploitation of resources:*

In inland water bodies, uncontrolled harvesting has resulted in depletion of stocks. Illegal methods such as dynamiting and the use of toxic chemicals and gases have resulted in major kills and have negatively affected fish populations. However, no estimation of the impact of these methods on inland waters' fish stocks or fish fauna has been carried out in Pakistan.

Landings of some commercially important species such as mahseer, kabanas, rita and a number of other cat fishes have decreased substantially despite the stocking of some natural water bodies.

No stock assessment of freshwater fish resources has been carried out over the last 15 years. This lack of information has prevented the determination of losses and changes in freshwater species composition, optimal harvesting levels and has impeded the implementation of adapted management measures.

#### *Increase in pollution and environmental degradation:*

Pollution has also increased in inland water bodies throughout the country, especially in the vicinity of large population and industrial centres, negatively impacting upon catches and the livelihoods and health of fishing communities depending on capture fisheries.

### ***Implementation plan objectives and activities to address these constraints:***

#### **Plan objective (PO) 2B.1: Rehabilitate inland aquatic habitats damaged by pollution and environmental degradation.**

2B.1.1 Contribute to the monitoring of impacts of pollution on water regimes and habitats when these have negative impacts on inland fisheries, and suggest remedial measures where necessary.

2B.1.2 Establish laboratories, including mobile testing units of water, soil and fish tissues.

2B.1.3 Contribute to negotiations for the establishment of plants for the treatment of industrial waste and domestic sewage to minimize pollution of inland aquatic environments and externalities to other users.

2B.1.4 Lobby for the implementation of the existing law on pollution control and enforcement of pollution controls in inland water bodies in all provinces.

2B.1.5 Lobby for a ban on use of polythene bags.

2B.1.6 Give law enforcement powers to Fisheries Department officials with regard to pollution control and equip them with modern technologies.

#### **Plan objective (PO) 2B.2: Control over-exploitation of inland fisheries resources.**

2B.2.1 Make concerted efforts to enforce the prevention of all forms of Illegal, Unreported and Unregulated (IUU) fishing in inland water bodies.

2B.2.2 Conduct resource surveys, and species stock assessments in inland waters.

2B.2.3 Set catch limits in freshwater bodies based on MSY.

2B.2.4 Prepare and implement a plan for the management and sustainable exploitation of each national water body based on the FAO Code of Conduct for Responsible Fisheries (CCRF) and related guidelines.

2B.2.5 Implement control measures from outlet canals to prevent fish from escaping and increase productivity of canals.

**Plan objective (PO) 2B.3: Promote sustainable management of inland aquatic resources.**

2B.3.1 Monitor the spread and impact of introduced and transplanted such as Tilapia and Chadu (an indigenous species) on indigenous species, and of invasive plant species such as Salvinia molesta on inland water bodies.

2B.3.2 Promote the use of environmentally-friendly biological, chemical and mechanical methods to control the spread of invasive, non-indigenous species.

2B.3.3 Implement ecosystems-based approaches to inland fisheries management when and where practically possible.

2B.3.4 Initiate a programme of awareness-raising targeted at the general population and at fishing communities about freshwater fish bio-diversity, natural fisheries environments and sustainable resource development.

2B.3.5 Restock freshwater bodies with seeds/fingerlings of commercially-important carp species.

2B.3.6 Establish fish sanctuaries in all provinces for endangered species.

2B.3.7 Declare zones up to 1 km up and downstream of headworks and barrages as reserved areas for fish breeding and survival.

2B.3.8 Establish a registration system for all fisherfolks.

**Plan objective (PO) 2B.4: Establish sustainable exploitation of untapped inland resources.**

2B.4.1 Ensure that hatcheries in all provinces enhance biodiversity through the production of fish seed of local species, such as Mahaseer, Sher mahi, Soul, Singahri, Khagga, Malli.

2B.4.2 Stock fingerlings of local species in natural water bodies.

2B.4.3 Investigate the potential to enhance cold-water fisheries.

**Plan objective (PO) 2B.5: Promote sport fishing activities in inland water bodies.**

2B.5.1 Dedicate water bodies to sport fishing activities.

2B.5.2 Rationalise the cost of license fees and establish a fool-proof system of collection of license fees.

2B.5.3 Advertise sport fishing and organise regular tournaments under government supervision.

2B.5.4 Ban the use of fish seed as bait for sport fishing.

### **STRATEGY AXIS 3:**

#### **RESOLVING POST-HARVEST ISSUES**

***(handling, storage, value-adding/processing, transport and marketing/commercialisation of captured and cultured species)***

#### ***Major problems and constraints to address:***

##### ***Lack of infrastructure:***

Lack of suitable infrastructure has been blamed as one of the key constraints to the development of the fisheries and aquaculture sectors of the country. In the context of capture marine fisheries, only four fish harbours are operational but no landing facilities are available at major fishing centres such as Ormara, Jiwani, Sonmiani, Kalmat, Ibrahim Hayderi, Keti Bundar and Shah Bunder. Similarly, road linkages along the coast of Pakistan are fragmentary. Other infrastructure facilities such as communication, educational and medical facilities still lack along most parts of the coast of Pakistan. Inland fisheries does not fare any better. There are no landing jetties at any inland landing centres in the entire country. Similarly, other infrastructure facilities are lacking for inland fishing communities. The lack of markets and auction centres prevent fishermen from inland water bodies in obtaining good prices for their products. Problems faced for the transformation of products from aquaculture are similar. Freezing is the main mode of processing to increase shelf-life. Few other value-addition activities are carried out.

##### ***Post-harvest losses:***

Post-harvest loss owing to poor handling practices, and a lack of preservation facilities on board fishing vessels and at landing centres, is some of the most important factors which result in the poor quality of raw material for processing and consumption. It is estimated that about 70 % of the harvested seafood becomes degraded or even putrefied before it reaches consumers or processing facilities. Opportunities to produce fish meal are missed as almost all bycatch from trawl fisheries is left to decompose. Although a programme for improvement of fish holds and handling in fish harbours was initiated under the aegis of SMEDA and the Fishermen's Cooperative Society, it was stopped due to a lack of technical expertise and commitment. A similar situation prevails in the pre-processing industry where shrimps are peeled under extreme unhygienic conditions. The situation is similar for freshwater fish products. Such shortcomings compromise the position and image of Pakistan in international markets, while simultaneously limiting accessibility of fish products to domestic consumers.

#### ***Implementation plan objectives and activities to address these constraints:***

##### **Plan objective (PO) 3.1: Improve the handling and preservation of fish and aquatic products.**

- 3.1.1 [priority]: Create auction and market centres for inland and marine fish products, at major inland fisheries centres (at district level) and fishing harbours respectively.
- 3.1.2 Build landing facilities along the coast and construct landing jetties at major inland fish landing areas and at other major freshwater fish producing water bodies.
- 3.1.3 Improve existing harbour facilities, including regular dredging and expansion.
- 3.1.4 Establish pre-processing industries (peeling sheds) in Karachi.
- 3.1.5 Assist in installation of quality ice making machines on board of fishing vessels and refrigeration systems on board of fishing boats involved in longer fishing operations.

- 3.1.6 Install quality ice making plants and cold storage facilities at all major fish harbours.
- 3.1.7 Facilitate the acquisition and upgrade of fish holds for larger boats and insulated boxes on smaller boats.
- 3.1.8 Create/improve quality control in the landing centres, including promoting the use of fish crates and insulated boxes.
- 3.1.9 Attract private investment in building and expansion of storage facilities at inland/coastal landing centers and near market centers.
- 3.1.10 Allow for the duty free import of equipment (fish boxes, reefer vans etc.).
- 3.1.11 Ensure adequate supply of potable water to landing centres, especially to Karachi Fish Harbour.

**Plan objective (PO) 3.2: Add value (transformation/processing) to aquatic products.**

- 3.2.1 Improve by-catch utilization.
- 3.2.2 Promote the establishment of private value-adding processing facilities.
- 3.2.3 Establish demonstration facilities for value addition and improved processing.
- 3.2.4 Raise awareness about small-scale fish processing methods.

**Plan objective (PO) 3.3: Improve transportation of aquatic products.**

- 3.3.1 Promote the use of insulated boxes and refrigerated carriers through provision of soft loans from banks and FDIs.
- 3.3.2 Lobby for the construction and improvement of road links from harbours and landing centres to the coastal highway and urban centres.

**Plan objective (PO) 3.4: Improve commercialisation of aquatic products.**

- 3.4.1 Improve hygiene conditions in all fish markets.
- 3.4.2 Review the legislation pertaining to the catching and sale of fish during the months of July and August.

**Plan objective (PO) 3.5: Improve access of aquatic products to international markets.**

- 3.5.1 Update fish quality control laws to ensure compliance with those of importing countries as well as ensure compliance of commodities with internationally-recognised standards of food safety and trade (e.g. WTO agreements, CODEX Alimentarius).
- 3.5.2 Address comprehensively quality issues and establish quality assurance programmes (e.g. HACCP) for freshwater and marine fisheries and aquaculture products.
- 3.5.4 Evaluate the impact of WTO and TRIP regimes on fishing, and aquaculture industries.
- 3.5.5 Increase the number of export points.
- 3.5.6 Establish a fish export processing zone at all major fish harbours.
- 3.5.7 Create a separate section/unit under the Export Development Board dealing specifically with fisheries and aquatic products.
- 3.5.8 Provide specific credit schemes to processors to facilitate compliance with national and international quality control requirements.
- 3.5.9 Draw on lessons from existing non-fisheries initiatives and the Corporate Social Responsibility (CSR) agenda in identifying ways to minimize the potential marginalisation of the poor through mitigating measures.

**Plan objective (PO) 3.6: Improve dissemination of market and product information.**

- 3.6.1 [priority] Monitor the effects of carp imports on prices and marketing.
- 3.6.2 Use most appropriate technology to reach producers/traders with market information.
- 3.6.3 Identify international market niches for captured and cultured aquatic products.

- 3.6.4 Develop a system of minimum price for fish and aquatic products on the model of other major agricultural commodities (e.g. cotton, wheat, mutton and chicken).
- 3.6.5 Monitor consumers' fish preferences, and provide subsequent advice on improved marketing, market segmentation, buyer requirements, and other characteristics of potential markets.
- 3.6.6 Investigate the potential for alternative low-price fish products for domestic markets.
- 3.6.7 Enhance the reputation of aquatic products of Pakistan origin on international markets.
- 3.6.8 Generically advertise the health benefits of fish consumption.

## ***2) Creation of a policy implementation and monitoring body***

The creation of clearly articulated implementation arrangements and the monitoring and evaluation of progress, is a pre-requisite for successful policy implementation, and thereby achievement of policy goals and strategies. The establishment and functioning (i.e. mandate, terms of reference, member constitution, role and responsibilities etc.) of respective institutional arrangements need to be the subject of a further full institutional analysis so as to build upon lessons learned from past institutional shortcomings experienced by similar bodies, in Pakistan and elsewhere.

Appended Part 2 of the National Policy and Strategy for Fisheries and Aquaculture Development in Pakistan outlines institutional set ups and mechanisms proposed for policy implementation and its overseeing/monitoring.

3) *Implementation matrices for each common element and axis of the strategy*<sup>3</sup>

**COMMON ELEMENT A Strengthening of Cross-Sectoral Collaborations**

<b>PO A.1: Establish strong collaborative partnerships to attract private investment in aquaculture (coastal and inland) and post-harvest activities</b>						
<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
A.1.1	Involve the private sector in fisheries and aquaculture projects developed by the Fisheries Depts, where necessary.	Provincial/Areas Fisheries Depts, Provincial/Areas and district governments, SMEDA, private sector, BOI, EDB, NGOs, BCDA, SDCA	1 year, regular activities thereafter	Provincial/Areas and federal governments	Mechanism is developed to involve the private sector in decision making about Fisheries Depts projects.	
A.1.2	Consult relevant ministries and banks regarding the provision of financial incentives to attract foreign investment in fisheries (seed and feed production, grow-out and post-harvest operations).	Provincial/Areas Fisheries Depts, MINFAL/Ministry of Finance, SBP, Banks and DFIs, SMEDA, CBR, BOI, EDB	1 -2 years, regular activities thereafter	Provincial/Areas and federal governments for the first year	Consultation process completed by end of year 1. Some indicators of foreign investment are available.	Major opportunities for private foreign sector investment are considered to be available in trout farming, catfish and coastal aquaculture (for domestic and international markets).
A.1.3:	Consult relevant ministries and banks for the development of matching grant, microfinance, interest-free and soft loan schemes to attract private entrepreneurs in production, post-harvest transformation and marketing, and other ancillary activities.	Provincial/Areas Fisheries Depts, MINFAL/Finance, SBP, Banks and DFIs, SMEDA, EDB	1 -2 years, regular activities thereafter	Provincial/Areas and federal governments for the first year (establishment of matching grants and other schemes)	Consultation process is completed by end of year 1. Indicators related to loans/credit provision are available. Matching grants, interest-free and soft loan schemes are available by the end of year 2.	Terms and duration of preferential credit schemes need to be defined.
A.1.4	Consult relevant ministries regarding the revision of the current income tax imposed on fishing and fish farming operations.	MINFAL, Finance, CBR, SBP, NGO, private sector	1 -2 years	----	Rescheduled special income tax scheme is in place by the end of year 2.	
A.1.5	Maintain and simplify duty-free import incentives on fishing and fish farming equipment and machinery.	MINFAL, EDB, CBR, private sector (importers/exporters)	1 year and continuous process thereafter	----	Simplified procedure for duty free import is in place by the end of year 2.	Tariffs need to be reviewed.
A.1.6	Implement insurance schemes for fishermen and fish farmers.	MINFAL, Finance, Provincial/Areas Fisheries Depts, National Insurance	1-5 years	Insurance companies	Insurance program for fisheries sector available by the end of year 5. Negotiations with insurance	

<sup>3</sup> In the following sections, the term ‘Areas’ should be understood as including AJK, FATA and FANA.

		Corporation, insurance companies.			companies are initiated by end of year 1.	
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<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
A.1.7	Establish Exclusive Fish Export Zones (EFEZ) in key locations.	Provincial/Areas Fisheries Depts, SMEDA, EPZA, private sector, CBR, Commerce, EDB, SCDA, BCD	1-5 years	EPZA, federal and Provincial/Areas governments	EFEZ are established in Karachi, Gwader, Lahore, Gujranwala, Abbatbat and Madayan (NWFP), Ketibandar and Sha Bundar (Sindh) with supporting infrastructures by the end of year 3.	Once EFEZ are established, CBR (Customs) becomes involved.
A.1.8	Negotiate the restoration of single-phase electricity connection to fish farmers and the installation of new main electricity connection lines and transformers at preferential rates.	MINFAL, WAPDA, Electricity Department	1-3 years	----	Restoration of single-phase electricity connection negotiated with WAPDA and effectively implemented by the end of year 3.	
A.1.9	Engage in discussions to ensure that a rational approach be adopted for assessing the value of land (at prevailing market value) and that waste land be identified for long-term private leasing for aquaculture development.	MINFAL, Provincial/Areas Fisheries Depts, Provincial/Areas Revenue Depts, BOR	1-2 years	----	Land is classified by the Board of Revenue as waste or marginal by the end of year 2. Suitability of land for aquaculture is determined by Provincial/Areas Fisheries Depts by the end of year 2. Land leases for fish culture are awarded by the Board of Revenue immediately afterwards.	A land policy was formulated in 2002 but banned leasing for political reasons.
A.1.10	Study and negotiate the possibility to allow small-scale land farmers to use the government land lease they currently have access to for agricultural purposes, for aquaculture on a long term basis.	MINFAL, Provincial/Areas Fisheries Depts, Provincial/Areas Revenue Depts	2-3 years	----	Study completed by the end of year 2. Small-scale land farmers are allowed to use their agricultural land for aquaculture purposes by the end of year 3.	

<b>PO A.2 Increase coordination of multiple uses of freshwater (surface and underground).</b>						
<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
A.2.1	Ensure that aquaculture is taken account of in future plans for investment in irrigation, irrigated agriculture and related infrastructures.	WAPDA, Irrigation depts, IRSA, Provincial/Areas Fisheries Depts, banks and DFIs, BOI, Agriculture Depts.	1 year, continuous process thereafter	Federal and Provincial/Areas government, banks and DFIs	Working group for the purpose is established by the end of year 1.	A Working group should be established, with representation from WAPDA.
A.2.2	Establish a joint Committee composed of representatives of all Ministries dealing directly and indirectly with freshwater use.	Agriculture Depts, local governments, WAPDA, Irrigation Depts, IRSA, Provincial/Areas Fisheries Depts, EPA	Within one year	Federal and Provincial/Areas governments, banks and DFIs	Committee is established by the end of year 1; regular committee meetings are held every six months.	Key action to be undertaken by the joint-Committee is to prioritise the assessment and revision of the conditions of issuance of No Objection Certificates (NOC) from the Irrigation Departments to optimize use of canal water for aquaculture.
A.2.3	Jointly engage in discussions and planning with other Ministries on priority uses, protection, sustainable development and increased productivity of freshwater resources.	Relevant ministries, Provincial/Areas Fisheries Depts, Irrigation Depts, WAPDA and other ministries, private sector, district governments, Agriculture Depts	2-3 years, continuous process thereafter	Federal and Provincial/Areas governments, donor agencies (ADB and World Bank)	Discussions are initiated by the end of year 2. Joint plan for water use developed by the end of year 3.	Other Ministries to consult may include: Commerce; Economic Affairs and Statistics; Education; Environment; Finance and Revenue; Health; Housing and Works; Local Government and Rural Development; Ports and Shipping; Tourism, Population Welfare; Women Development.

**PO A.3 Establish strong collaborative partnerships and processes to ensure adequate and sustainable water flows in major rivers and tributaries and re-establish balanced water regimes/use and ecosystems**

APO		People & Partnership	Timeline	Funding	Targets/Indicators	Comments
A.3.1	Ensure that interests from the Fisheries Depts are taken into account in water allocation.	Federal and Provincial/Areas Fisheries Depts, WAPDA, IRSA, World Bank, Ministry of Water and Power	1-5 years and continuous thereafter	----	Fisheries Sector representation/views are made known to IRSA.	
A.3.2	Partake in the decision-making process concerning the reclamation and rehabilitation of areas affected by salinity.	Federal and Provincial/Areas Fisheries Depts, Ministry of Water and Power, Irrigation Depts and WAPDA, BOR, Social Welfare Department; Ministry of Housing and Works, World Bank	1-5 years	----	Fisheries Depts are involved in the decision making process by the end of year 2.	Since resettlement on account of salinity may have a social impact, Social Welfare Department; Ministry of Housing and Works are included in the partners
A.3.3	Partake in the decision-making process concerning the implementation of drainage measures.	Federal and Provincial/Areas Fisheries Depts, Ministry of Water and Power, Irrigation Departments, and WAPDA, World Bank	2-5 years	World Bank (for implementation of drainage measures)	Fisheries Depts are involved in the decision making process by the end of year 2. Drainage plan is prepared in collaboration with Fisheries Depts by the end of year 5.	Reference is made to Pillar #1 of World Bank Report No. 34081-PK Pakistan Country Water Resources Assistance Strategy "Water Economy: Running Dry", 22 November 2005.
A.3.4	Monitor the impact of water diversions on habitats and livelihoods, and develop guidelines for the mitigation of negative impacts.	Provincial/Areas Fisheries Depts, Irrigation Depts, EPA, NGOs, WAPDA, World Bank, research institutions i.e. PARC/NARC, Irrigation Research Centre, Fisheries Research Institute Lahore.	3-5 years, regular monitoring	Federal and Provincial/Areas governments, donor agencies (e.g. DFID, UNEP, World Bank)	Regular program of monitoring is in place by the end of year 3. Action plan for mitigation of negative impact on habitats and livelihoods is ready by the end of year 5.	Inclusion of fish ladders may be considered.
A.3.5	Partake in the decision-making process concerning the increase in water diversions to recreate habitats.	Federal and Provincial/Areas Fisheries Depts, Ministry of Water and Power, Irrigation Departments, World Bank	1-5 years	----	Fisheries Depts are involved in the decision making process regarding water supply to important habitats by the end of year 2.	Special negotiation is required with Sindh and Punjab Irrigation Depts. regarding supply of freshwater at critical times to Keenjhar Lake in Sindh and other major lakes/reservoirs specifically during breeding season (June to August).

<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
A.3.6	Advocate for the implementation and enforcement of effluent water treatments (including recycling for agricultural purposes) by all industries in urban areas.	Provincial/Areas Fisheries Depts, Irrigation Depts, EPA, local governments, Public Health and Engineering Dept; Agriculture Depts, industrialists.	2-8 years	Federal and Provincial/Areas governments, donor agencies	Lobbying mechanisms for the fisheries sector are in place to ensure the implementation and enforcement of effluent water treatments. Fisheries sector's representation / views are conveyed to relevant Ministries/Departments.	Planning in Gwader and other coastal areas should take this into consideration immediately.
A.3.7	Negotiate freshwater supply to fish farms at critical times.	IRSA, Irrigation Departments, Provincial/Areas Fisheries Depts, private fish farmers and fish farmers associations	1-2 years, continuous thereafter	----	Fisheries sector interests are included in negotiations, resulting in water availability ensured at critical times.	

#### **PO A.4 Support wide-ranging livelihood needs in fishing communities.**

<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
A.4.1	Assess, plan and develop community infrastructures and facilities supporting overall livelihoods.	Provincial/Areas Fisheries Depts, Health and social welfare departments, NGOs, WAPDA, Education, Building and Roads Departments, Ministry of Communication, National Highways Authority, P&D Dept.	1-8 years	Provincial/Areas and federal governments, donor agencies, UNIFEM, CIDA, JICA, UNICEF, SAARC, WHO, end-user contributions	Prioritized list of communities for interventions is drawn up by the end of year 2. Specific indicators shall be developed as part of the planning process.	Infrastructures and facilities may include houses, clinics, net mending sheds, schools, water supply/sanitation in all fishing communities. Immediate development of facilities in Chilya, Machar Lake in Sindh, Cheshma, Balloki, Taunsa, Trimmu in Punjab. Building of sheds in Astola Island, is recommended.
A.4.2	Reclaim land in the Baba and Bhit Islands, and Shamspear area to develop livelihoods facilities (school, hospital and shrimp peeling sheds).	Baba Island Fishermen's cooperative society, KPT, Pakistan Navy, SFD, PSIA, FCS, Ministry of Education, Ministry of Health, SMEDA and NGOs, P&D Dept.	1-4 years	KPT, FCS, donor agencies (e.g. SFD), federal, Provincial/Areas, local governments and NGOs.	Land is reclaimed for development of facilities by the end of year 2.	Dredge material from Karachi Port can be used for reclamation purposes.
A.4.3	Support literacy, vocational training and other educational programs in fishing communities.	Education Ministry, Provincial/Areas Fisheries Depts, Women Development, Social Welfare and Special Education Ministry, Labor Depts and NGOs	1-5 years, on-going	Provincial/Areas and federal governments, donor agencies, UNIFEM, UNICEF, ILO	Literacy, vocational training programs are in place by the end of year 3.	Some activities should be related to income generation for women. This APO is also related to APO A.4.5.

<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
A.4.4	Support alternative and/or complementary livelihood activities in fishing communities through increasing access to credit and savings schemes and the provision of micro-finance initiatives.	Provincial/Areas Fisheries Depts, SMEDA, NGOs, Women Development, Social Welfare and Special Education Ministry, Ministry of Finance (micro-finance), SBP	1- 8 years	Provincial/Areas and federal governments, donor agencies (e.g. ADB, Agha Khan Rural Support (AKRSB))	Alternative livelihood activities are identified. Alternative livelihood activities are started in 50% of coastal/fishing villages. Maliwal Village initiative is replicated in two villages of each province by the end of year 3.	Some activities should be related to income generation for women. This APO is also related to APO A.4.5.
A.4.5	Promote the participation of women, and benefits from their involvement, in aquaculture, post-harvest and other livelihood activities.	Women Development, Social Welfare and Special Education Ministry, Provincial/Areas Fisheries Depts, Labor Departments, NGOs, SMEDA, WWF	1-5 years	Provincial/Areas and federal governments, donor agencies (e.g. NRSP, ADB, AKRSB, UNIFEM)	10% of household income is contributed by women by the end of year 3; 30% by year 5. Women's involvement in decision making is significantly increased.	Allied activities to promote amongst women may include net mending and making, ornamental shell collection and craft making in coastal zones.
A.4.6	Advocate for the allocation of marginal land for agricultural use to fishing communities who are affected by water diversion/limited release of water in the River Indus.	Provincial/Areas Fisheries Depts, Agriculture Depts, Irrigation Depts, WAPDA, BOR	1-5 years, continuous thereafter	----	Appropriate representation of the Fisheries sector is made to other Ministries/Departments. Marginal land is allocated to affected communities by the end of year 5.	Social impact of change in lifestyle from fisheries to agriculture should be studied and monitored by sociologists and anthropologists.
A.4.7	Support attempts by fishing communities to gain security of land and housing rights.	Provincial/Areas Fisheries Depts, WAPDA, Irrigation Depts, BOR	1-5 years	Provincial/Areas and federal governments	Provincial/Areas Fisheries Depts lobby for fishing communities interests to BOR. 50% of fishing communities get land housing right by the end of year 5.	Priority for help may be given to fishing community at Cheshma barrage, Kinjer, Manchar, Chotiari; Formation of cooperatives may be encouraged (c.f. APO B.3.1). Note that WAPDA may not support if near its installations.
A.4.8	Advocate for the fisheries sector to be considered under the old age benefit scheme.	Provincial/Areas Fisheries Depts, EOBI, Social Welfare Department, NGOs	1-2 years	EOBI	Provincial/Areas Fisheries Depts lobby for old age benefit scheme. Scheme for old age benefit for fishermen is in place by the end of year 5.	EOBI may be approached to provide a special program for fishermen
A.4.9	Impose a levy on all aquaculture projects covering more than 50 ha to be paid towards a social development fund for the local population.	Excise and Taxation Department, CBR, Provincial/Areas Fisheries Depts, private sector	1-5 years, continuous thereafter	Federal, Provincial/Areas and district governments	System of collection of levy in place by the end of year 2. Program for social development implemented by the end of year 3.	

**PO A.5: Implement integrated coastal area management and reduce occurrence of resource conflict and environmental degradation in coastal areas**

<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
A.5.1	Increase coordination and cooperation among multiple users of coastal resources (land, water, forest).	Provincial/Areas Fisheries Depts, MFD, City District Governments, SCDA, BOR, BCDA, NIO, EPA, NGOs, Forest Depts, FCS, private sector	1-5 years, continuous thereafter	----	Program for awareness of coordination is started immediately. Coordination mechanism is established by the end of year 2. Cooperation in started among multiple users of coastal resources by the end of year 2.	Provincial/Areas Fisheries Depts and EPA should enforce the rules.
A.5.2	Engage in, and support, fisheries interests in all coastal area planning and management processes through a mechanism for cross-sectoral integration and participatory decision-making.	Provincial/Areas Fisheries Depts, MFD, City District Governments, BOR, BCDA, SCDA, NIO, EPA, NGOs, FCS, Forest Depts, private sector	1-5 years, continuous thereafter	MFD, Provincial/Areas Fisheries Depts	Mechanism for participatory planning and management is established by the end of year 2.	Interactions between departments and NGOs.
A.5.3	Develop a coordinated mechanism for monitoring and ensuring compliance of legislations pertaining to non-fisheries related coastal resources such as mangroves, turtles etc.	Provincial/Areas Fisheries Depts, MFD, City District Governments, CDA, BOR, BCDA, SCDA, NIO, EPA, NGOs P&D Departments, WWF, IUCN, Forest Depts	1-5 years	MFD, Provincial/Areas Fisheries Depts, Forest Depts, ADB, FAO, UNIDO, UNEP	Mechanism for coordination and monitoring is in place by the end of year 2.	Legislation for conservation of biodiversity in coastal areas needs to be enacted.
A.5.4	Formulate and implement an integrated coastal zone management (ICZM) plan for the Indus estuary and other coastal areas.	MFD, Provincial/Areas Fisheries Depts, City District Governments, BOR, BCDA, SCDA, NIO, EPA, NGOs P&D Departments, WWF, IUCN, Forest Depts, Ministry of Science and Technology, PCSIR, academia, industrialists, aquaculturists, FCS and fishing communities	1-10 years	MFD, Provincial/Areas Fisheries Depts, donor agencies, FAO, ADB, UNEP, and others	ICZM plan is prepared by the end of year 3. A mechanism for implementation of the ICZM plan is developed by the end of year 4.	

<b>PO A.6: Promote environmental conservation and adopt measures to prevent damage to aquatic biodiversity by pollution and environmental degradation.</b>						
<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
A.6.1	Evaluate existing laws and their appropriateness in reducing pollution and environmental degradation and lobby Ministry of Law for making necessary changes and assist in the formulation of new laws for land-based pollution sources.	Provincial/Areas Fisheries Depts, Ministry of Law, MFD, EPAs, BCDA, SCDA, GDA, district governments, Provincial/Areas Industries Depts and Federal Ministry of Industries and Production, NGOs, IUCN, WWF, industrialists	1-3years	Federal and Provincial/Areas governments, donor agencies (e.g. UNEP)	Evaluation process is completed by the end of year 2. Results and recommendations of the evaluation are disseminated to Ministry of Law by the end of year 3.	Evaluation of NEQs should be done, keeping in view the concerns of the fisheries sector.
A6.2	Establish wetland reserves.	Ministry of Environment, ZSD, WWF, IUCN, Provincial Wildlife Depts, NCCW	1-5 years	----	x ha of wetland reserves are established through appropriate legislation by the end of year 5.	Inland areas should be given due consideration. For marine and coastal areas, see APO 2A.3.11.

**COMMON ELEMENT B Institutional Improvements and Developments within the Fisheries and Aquaculture Sectors**

<b>PO B.1 [priority]: Strengthen current fisheries institutions, through a better demarcation of roles and responsibilities.</b>						
<b>APO</b>		<b>People and Partnerships</b>	<b>Timeframe</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
B.1.1	Strengthen Provincial/Areas and District Fisheries Depts' role in implementation and monitoring of fisheries management measures.	Federal, Provincial/Areas and district governments, MFD, Provincial/Areas Fisheries Depts, FATA administration, AJK government	1-5 years (continuous activity thereafter)	Federal, Provincial/Areas governments and district governments, donor agencies	Induction of new staff and demarcation of duties to be completed by the end of year 2. Institutional strengthening through capacity building to be started from year 1 and completed by the end of year 3.	Consultants may be considered for conducting study on demarcation of duties between various agencies and within key fisheries institutions. Management Services Division (Cabinet Division) may carry out the study.
B.1.2	Increase awareness among the government hierarchy on the need for properly functioning institutions to support fisheries and aquaculture development.	Federal, Provincial/Areas and district governments, Ministries of Education and Information, MINFAL, NIPA, universities and training centres.	1-3 years (continuous activity thereafter)	Federal, Provincial/Areas governments and district governments, donor agencies	Created awareness through workshops, seminars, symposia by the end of year 3 and continued thereafter.	Such awareness is especially needed for high-ranking officials. Lectures, sectoral analyses and field studies of fisheries institutions may be included in curricula of NIPA, National Defence College and other management training courses.
B.1.3	Carry out a full institutional assessment of government staffing levels and skill sets against needs/requirements for sectors' management and development.	Federal, Provincial/Areas and district governments, MFD, Provincial/Areas Fisheries Depts, FATA administration, AJK government, SCDA, BCDA	1 year	Federal, Provincial/Areas governments and district governments, donor agencies	Institutional assessment study is completed by the end of year 1.	Consultants may be appointed for the purpose. Management Services Division (Cabinet Division) may carry out the study. Provincial/Areas Fisheries Depts should be included in priority for the institutional assessment.
B.1.4	Increase, and/or relocate, staff across institutions for improved efficiency.	Federal, Provincial/Areas and district governments, MFD, Provincial/Areas fisheries Depts, FATA administration, AJK government	1-3 years	Federal, Provincial/Areas governments and district governments, donor agencies	Staff are recruited and/or relocated by the end of year 3.	Staffing recommendations will stem from the institutional analysis to be carried out.

<b>APO</b>		<b>People and Partnerships</b>	<b>Timeframe</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
B.1.5	Improve communications among private sector players and organizations involved in fisheries and aquaculture management and development.	Federal, Provincial/Areas and district governments, Provincial/Areas Fisheries Depts, NGOs, FCS, PSIA, fishermen and fish farmers associations, private sector, SCDA, BCDA, EPAs, EDB	1-2 years (continuous activity thereafter)	Federal, Provincial/Areas and district governments	Improved communication linkage with various players of the fisheries and aquaculture sectors is established by the end of year 2. Fisheries Depts have developed a communication strategy for the private sector, fisheries organisations and other Departments/Ministries by the end of year 2.	
B.1.6	Clearly specify and publicize responsibilities of federal, Provincial/Areas and district fisheries authorities and their activities linked to the development and management of marine/inland fisheries, and coastal/ inland aquaculture.	Federal, Provincial/Areas and district governments, NGOs, FCS, PSIA, fishermen and fish farmers associations, Provincial/Areas Fisheries Depts, SCDA, BCDA	1-2 year	Federal, Provincial/Areas governments and district governments, donor agencies	Study conducted and report completed by the end of year 2. Responsibilities and activities of Federal, Provincial/Areas and district authorities are specified by the end of year 2.	Consultants can be hired for the study. Clearly demark and reattribute responsibilities of various agencies/ departments (e.g. between BCDA, BFD and other Provincial/Areas Fisheries Depts and organizations).
B.1.7	Ensure participation of all groups and stakeholders, including women, in devolution, bottom-up and transparent decision-making processes pertaining to fishing and aquaculture.	Federal, Provincial/Areas and district governments, NGOs, FCS, PSIA, fishermen and fish farmers associations, Provincial/Areas Fisheries Depts	1-2 years (continuous activity thereafter)	Federal, Provincial/Areas governments and district governments, donor agencies	Mechanisms are established and documented to ensure wider participation by the end of year 2.	

**PO B.2 Reform/ reorganize Provincial/Areas and district authorities and existing institutions to make them more responsive to the needs of fisheries/aquaculture development and management.**

<b>APO</b>		<b>People and Partnerships</b>	<b>Timeframe</b>	<b>Funding</b>	<b>targets</b>	<b>Comments</b>
B.2.1	Broaden the responsibilities of the Marine Fisheries Department to include regulatory powers concerning importation of fish in the country.	MFD, AQD, MINFAL, CBR, Ministry of Law, Justice and Human Rights	2 years	----	Fish importation matters are assigned to Marine Fisheries Department by the end of year 2.	Presently, fish importation is being dealt by the Animal Quarantine Department. Importation matters can be initially assigned to MFD through an administrative order followed by an amendment in Pakistan Fish Inspection and Quality Control Act, 1997 through parliament.
B.2.2	Limit the role of District governments to the provision of extension services and place training and hatchery operations (for demonstration) under the responsibility of the Provincial/Areas Fisheries Depts.	Provincial/Areas Fisheries Depts, district governments, FATA administration, AJK government	1-2 years	----	Fisheries training centers and hatchery operations are retained with respective Provincial/Areas Fisheries Depts, whereas extension services are transferred to district governments by the end of year 2.	There is need to thoroughly examine the work distribution & power delegation among Provincial/Areas Fisheries Depts and district governments (cf. APO B.1.6). The example of efficient training centers and hatchery operations under the responsibility of the Fisheries Dept of Punjab could be replicated to other provinces.
B.2.3	Place the control of all natural fisheries resources/public water bodies under the responsibility of Provincial/Areas Fisheries Depts (and not with Forest Depts).	Relevant Provincial/Areas fisheries and Forest Depts	2-3 years	Provincial/Areas governments	Management of fisheries in all water bodies is transferred to Provincial/Areas Fisheries Depts by the end of year 3.	Uniform rules and regulations are needed for the management of fisheries and aquaculture in all water bodies.

<b>PO B.3: Support the formation of producers' organisations</b>						
<b>APO</b>		<b>People and Partnerships</b>	<b>Time-frame</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
B.3.1	[priority]: Promote the formation of associations, societies and cooperative organizations of fishermen and fish farmers for collective problem solving.	Provincial/Areas Fisheries Depts, Cooperatives departments, District Governments, Social Welfare Department, NGOs, private fish farmers, fishermen.	1-7 years	District governments, NGOs, Donors	One producers' association is established in each HPZ by the end of year 4 and in remaining districts by the end of year 7.	Aquaculture-oriented, and fisheries-oriented organizations/ associations may be kept separate. Legal recognition shall be given to producers' associations. Such associations will help in reducing conflicts, creating better environments in public water areas and in enhancing fish production as well as socio-economic conditions in rural areas. Support of NGOs in the establishment of fishermen and fish farmers' organizations/associations may be sought.
B.3.2	Promotion of cooperative arrangements for the establishment of transportation and marketing facilities.	Fish traders, fish transporters	1-4 years	Citizen Community Boards in district governments, NGOs, Donors	One traders' association is established in each HPZ by the end of year 4.	Fisheries Depts will assist in the establishment of fish traders' cooperative bodies at district levels through their District officers. Under this arrangement, 20% is contributed by farmers and 80% by the District Government.

<b>PO B.4: Study and reform the existing contract system for the exploitation of freshwater bodies.</b>						
<b>APO</b>		<b>People and Partnerships</b>	<b>Timeframe</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
B.4.1	Carry out a study of the merits and disadvantages of both the contract and license systems prior to taking further actions.	Provincial/Areas Fisheries Depts, NGOs, CBOs, FCS, PFF, Fishermen associations, FAO, WAPDA	1-3 years	Provincial/Areas governments, donors agencies	Report on merit and demerits is prepared by the end of year 1. Decision on choice of fisheries management method is made by the end of year 3.	Creation of an independent task force to carry out the study may be considered or/and consultants may be appointed. WAPDA should be involved in the study. The study may be conducted separately for coastal areas, large lakes, canals & small water bodies. All possible forms of fisheries management should be evaluated in the study.
B.4.2	Replace the existing contract system with a more appropriate system of exploitation of inland waters, if found suitable in the study carried out under APO B. 4.1.	Provincial/Areas Fisheries Depts and district governments, CBOs, NGOs, PFF, Fishermen associations, FAO	3-7 years	Provincial/Areas and district governments, donor agencies	Contract system is phase out at the end of year 3, if study findings support another form of management. The new management method is pilot-tested during a three-year period from the beginning of year 4.	TURFs, licensing, cooperative and long-term leases may be given due consideration. Levels of licence fees should be set so that the poor are not marginalised.
B.4.3	Ensure that all fishermen are officially registered.	Provincial/Areas Fisheries Depts, Fishermen associations, fishermen, NGOs	1-3 years	Provincial/Areas and district governments	All professional fishermen are registered by the end of year 2.	Water bodies' carrying capacity should be monitored in line with established MSY.

<b>PO B.5: Address current fisheries and aquaculture legislation and regulations shortcomings.</b>						
<b>APO</b>		<b>People and Partnerships</b>	<b>Timeframe</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
B.5.1	Revise current fisheries legislation and make amendments, as appropriate, to support the implementation of the present fisheries and aquaculture policy and strategy and minimize conflicts over fisheries resources.	MFD, Provincial/Areas Fisheries Depts, Law Depts, FAO	1-2 years	----	Legal review is completed by the end of year 1. Legislation is revised based on prioritisation contained within the legal review.	Short and long term legal requirements as well as international treaties, conventions and commitments should be taken into account. Conflict and dispute resolution mechanisms should be included in the legislation revisions proposed.
B.5.2	Design new/updated legislation and regulations with respect to the maintaining of aquatic species gene pools and genetic diversity and the prevention of trans-boundary movements of fish in aquaculture.	Provincial/Areas Fisheries Depts, Law Depts, MINFAL, Ministry of Environment, WWF, IUCN, FAO	2-4 years	----	Updated legislation is enacted by the end of year 4.	
B.5.3	Liaise with Environment Protection Agencies over environmental management regulations to control pollution in inland and coastal waters.	EPAs, Provincial/Areas and federal governments, Provincial/Areas Fisheries Depts, Law Depts	1-2 years	----	Fisheries sector views on environmental regulations are communicated to relevant EPAs on a regular basis.	New and updated legislation and regulations should safeguard against coastal degradation (acid-saline oxidation problems, mangrove deforestation, salinisation of coastal soils) and prevent illegal and over-fishing.
B.5.4	Support non-fisheries specific legislation such as laws relating to human rights, migration and access to social security, workers rights under IRO (Industrial Relation Ordinance) and decentralization to be put in place simultaneously.	Provincial/Areas Fisheries Depts, Law Depts, district governments, NGOs, human rights organizations, Ministry for Population Welfare, Ministry of Health and Ministry of Labour.	1-5 years	Federal and Provincial/Areas governments, Provincial/Areas Fisheries Depts, donor agencies	Fisheries sector views are made known to non-fisheries ministries/departments. Special provisions are made for fishermen and fishing communities under non-fisheries specific legislation by the end of year 5.	
B.5.5	Establish special fisheries courts and magistrates to deal with fishing-related offences.	Ministry of Law, Justice and Human Rights, Provincial/Areas Fisheries Depts, Law Depts, Provincial/Areas and district governments	1-4 year	Provincial/Areas governments	Special fisheries courts are established by the end of year 4.	Reference to the example of Indian courts may be made.

<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
B.5.6	Ensure that compulsory environmental impact assessments (EIA) are carried out prior to all investments in coastal aquaculture operations, and major fisheries and coastal development schemes.	MFD, Provincial/Areas Fisheries Depts, BCDA, SCDA, EPAs, private sector	2-3 years	Federal and Provincial/Areas governments	EIAs for all aquaculture projects is mandatory by the end of year 2. Compliance with environmental impact assessment regulations by major fisheries, aquaculture and coastal development schemes is mandatory by the end of year 3.	
B.5.7	Enhance inter-ministry/department collaboration and staff dedicated to control IUU fishing.	MSA, MFD, Provincial/Areas Fisheries Depts, BCDA, District governments, Police, WAPDA	1-3 years (continuous activity thereafter)	Federal, Provincial/Areas and district governments	Inter-ministry/department staff are involved in developing and implementing an MCS strategy by the end of year 3.	Monitoring of illegal fishing and poaching may be carried out using latest technologies including satellite based vessel monitoring system.

<b>PO B.6: Recognise and promote the role of communities in fisheries management in coastal and inland areas.</b>						
<b>APO</b>		<b>People and Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
B.6.1:	Devolve fisheries management responsibilities to inland and coastal fishing communities.	Provincial/Areas Fisheries Depts, district governments, FAO, NGOs, fishing communities, fishermen, FCS and their associations, CBOs	2-7 years	Provincial/Areas and district governments, donor agencies	See APO B.2.3: management responsibilities are shared between communities and government in 50% of fishing communities by the end of year 4; and in 100 % of fishing communities by the end of year 7.	New <i>integrated</i> management methods should be implemented in consultation with fishing communities and other water users (inland and coastal), under the patronage of the Provincial/Areas Fisheries Depts. Management of Keenjhar Lake may be entrusted with representative fishermen association for 2 years as a test. Other places for integrated management by also be considered. Examination of legal implications is required.
B.6.2	Provide special support to strengthen community-based fisheries and representative organizations, in particular in relation to the management of fisheries resources.	Provincial/Areas Fisheries Depts, district governments, fishermen associations, fishing communities, FCS, NGOs, CBOs, Social Welfare Department, FAO	3-4 years	Provincial/Areas and district governments, donor agencies	Community based fisheries institutions are established or strengthened (where in existence) by the end of year 3.	Community-based fisheries management may not be as relevant in Punjab as in other provinces as few complaints have been recorded in relation to the existing contract system (the fisheries Rules and Fisheries Ordinance) in Punjab. Examination of legal implications is required.
B.6.3	Institutionalize consultation mechanisms between opposing interest groups to find common and acceptable solutions.	Provincial/Areas Fisheries Depts, district governments, MFD, PFF, NGOs, CBOs, fishermen associations, FCS, BCDA, SCDA	2-5 years	Federal, Provincial/Areas and district governments, donor agencies	A forum for such negotiation/ consultation system is established by the end of year 2 and cases are dealt with from then on.	Conflict between Pakistan Fisherfolk Forum and Deep Sea Trawlers Association regarding deep sea resource management and preservation of the livelihoods of coastal communities can be one such example which can be resolved.
B.6.4	Improve communication linkages with coastal areas and establish tsunami and cyclone warning and prevention centers in coastal areas.	Provincial/Areas Fisheries Depts, district governments, MFD, MSA, Coast Guards, Pakistan Navy, DG (Port and Shipping), NGOs, CBOs, fishermen associations, FCS, BCDA, SCDA	2-5 years	Federal, Provincial/Areas and district governments, donor agencies	Warning and rescue centers are established by the end of year 3.	
B.6.5	Implement a programme designed by SCDA for the integrated development of the Indus Delta and related estuarine zone.	Provincial/Areas Fisheries Depts, district governments, MFD, fishermen associations, fishing communities, FCS, SCDA, WWF, IUCN	2-8 years	Federal, Provincial/Areas and district governments, donor agencies, ADB	Implementation of the programme is started by the end of year 2.	DCO (Thatta) has also prepared a programme/plan which may be looked into.

## COMMON ELEMENT C Development of Human Resources and Skills

<b>PO C.1 Provide fisheries and aquaculture training programmes and suitable training facilities</b>						
<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeframe</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
C.1.1	Reactivate the training program at Fisheries Training Centre in Karachi and Chilya (Sindh).	MFD, SFD, FCS, Fishermen and fish farmers associations, HEC and academic institutions (national and international), NACA	1-2 years	Federal government, Government of Sindh, HEC, donor agencies	Training centers at Karachi and Chilya are rehabilitated and training programme started by the end of year 2.	Training programmes at Chilya may include courses on hatchery development, fish catching, preservation and quality control. Training on freshwater prawn shrimp farming at FTC in Karachi may also be started.
C.1.2	Establish a fisheries training centre in Gwader and Dera Murad Jamali on fisheries and aquaculture disciplines (Balochistan).	BFD, BCDA, MFD; Fishermen and fish farmers associations, HEC and academic institutions (national and international), NACA	2-5 years	Federal government and Government of Balochistan, donor agencies, HEC	A training center is established at Gwader by the end of year 3, and another is established at Dera Murad Jamali by the end of year 5.	In Punjab, training sub-centers in Bhawalpur and Rawalpindi are functioning successfully but there is a need to establish such centres at Gujranwala and Muzaffargarh.
C.1.3	Establish an aquaculture training centre at Naran, Abbagogan, Gujranwala, and Muzaffargarh, and strengthen training facilities at Madyan for promotion of trout culture (NWFP).	Fisheries Dept (NWFP), private fish farmers and their associations, HEC and academic institutions (national and international), NACA	3-5 years	Federal government and Government of NWFP, donor agencies (JICA, KOICA, ADB)	The Madyan training center is strengthened by the end of year 3. A new training center is established at Naran by the end of year 4.	Assistance of NACA to be sought for improvement of training programmes and setting up curricula. Others places for training centres may be considered
C.1.4	Strengthen technical expertise of the staff of the Fisheries Depts through participation in regular skills development courses and training programs.	MFD, Provincial/Areas Fisheries Depts, academia, research institutions (national and international), P&D Depts.	1-2 years, continuous thereafter	Federal and Provincial/Areas governments NACA, SEAFDEC, donor agencies (e.g. JICA, KOICA, ADB), technical exchange programs	Evaluation of the technical needs of the Fisheries Depts is completed within 6 months. A training programme is developed for all Fisheries Depts staff by the end of year 1. Regular training programs for staff are initiated from year 2 onwards.	Training and skill upgrading of fisheries department staff abroad at PhD and Masters levels may be considered.

<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
C.1.5	Start university degree programs specific to fisheries sciences, fisheries management and aquaculture management.	Federal and Provincial/Areas Fisheries Depts, universities, HEC, P&D Dept (for approval)	1-3 years, continuous thereafter	Federal and Provincial/Areas governments, NACA, SEAFDEC, donor agencies (JICA, KOICA, ADB), universities	New curriculum is prepared and degree programs are initiated in 3 main universities by the end of year 3. Restructured degree, diploma programs and syllabi are finalized by the end of year 1. Post-graduate diploma/masters and degree courses on fisheries and aquaculture are available to students by the end of year 2.	Such programs must envisage practical training of the students at fish hatcheries and Fisheries Depts with some credit marks/hours to make the courses fruitful & job-oriented ("learning by doing"). Due consideration should be given to the existing Forestry model for training people in service.
C.1.6	Develop training modules for sustainable fisheries practices for building capacities and skills for sustainable management of ecosystems at all levels.	Federal and Provincial/Areas Fisheries Depts (including BCDA, SCDA), NGOs, FCS, fishermen and fish farmers organisations, IUCN, WWF, FAO, Worldfish Center, fisheries training centers (Karachi and Lahore)	1-3 years	Federal and Provincial/Areas Fisheries and Education departments, HEC, donor agencies IUCN, WWF	Ecosystem & biodiversity friendly fisheries and aquaculture degree & diploma courses & certificate programs are available at FTCs by the end of year 2.	The FAO Code of Conduct for responsible fisheries should be the basis for the development of such modules. Training programmes developed should target both Government officials and students.
C.1.7	Broaden the range of topics covered in training programs to make them more relevant, effective and practical.	Federal and Provincial/Areas Fisheries Depts, fisheries training centers (Karachi and Lahore), FCS, fishermen and fish farmers organizations, universities	1-2 years	Federal and Provincial/Areas governments, donor agencies	Curricula are modified by the end of year 1. Manual for training is prepared by Year 2. Training courses for these subjects are started by Year 2.	Subjects such as conservation biology, aquatic biodiversity and ecology, environmental management, safety at sea, animal health, processing technologies, cleanliness and hygiene, quality control, HACCP, hatchery management, business development and marketing, economics, accounting should be considered for inclusion in curricula.

<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
C.1.8	Establish a system of certification of training courses and programs at national level to ensure that only certified staff be employed in the fisheries and aquaculture sectors, in particular in processing factories.	Federal and Provincial/Areas Fisheries Depts, BCDA, SCDA, Ministry of Education, universities, fisheries training centres (Karachi and Lahore), P&D Depts.	1-8 years	Federal and Provincial/Areas departments donors agencies, HEC	A comprehensive certification system of all available training courses is developed by the end of year 3. Mandatory trained staff are available for employment in the fisheries and allied sectors by the end of year 4.	Poor fishermen should receive free training in training centres. Training will stimulate staff.
C.1.9	Ensure that opportunities for study tours abroad are provided to trainees as part of training on fisheries and aquaculture.	Federal and Provincial/Areas Fisheries Depts, MINFAL, BCDA, SCDA, FCA, PSIA, fishermen and fish farmers organisations, private sector, Provincial/Areas P&D departments, EAD, NACA, SEAFDEC, fisheries training centres (Karachi and Lahore), universities, WAPDA	1-5 years, continuous thereafter	Donor agencies, Technical assistance programs, NACA, SEAFDEC, JICA, ADB, CIDA, NORAD,	Indicators of opportunities are the number of study tours offered and the number of participants attending based on funding available.	
C.1.10	Ensure that training courses on the culture of ornamental species and improved fishing methods, including net making, are designed and targeted at women.	Federal and Provincial/Areas Fisheries Depts, FCS, NGOs CBOs, National Commission on the Status of Women	1-2 years, continuous thereafter	Federal, Provincial/Areas and District governments, donor agencies, UNIFEM	Training courses for women are designed by the end of year 1 and initiated by the end of year 2. About 100 women are trained every year in each district from then on.	Such training courses may be delivered through mobile extension and training units to facilitate access. Training programs may cover all aspects related directly and indirectly to fisheries and aquaculture cottage industries (e.g. net mending, shrimp peeling and marketing etc.).
C.1.11	Propose to Education Departments that fisheries and aquaculture-related subjects are included in primary and secondary curricula in areas of high fisheries production potential, or where livelihoods depend strongly on the sector.	Federal and Provincial/Areas Fisheries Depts, Education Departments, district governments, text book boards, teachers associations	2-3 years	Federal and Provincial/Areas governments, FAO, SEAFDEC, Ministry of Education	Examples of educational contents on fisheries and aquaculture are provided / demonstrated to Education Departments. Easy and small lessons on fisheries and aquaculture-related subjects are included in school curricula in appropriate areas by the end of year 2. Teachers' training is initiated by the end of year 3.	Short courses for teachers may be organized in fisheries training centers. Aquaculture may also be adopted as vocational subject in secondary schools as is agriculture. In collaboration with Provincial/Areas Fisheries Depts, schools should arrange farm visits for students/pupils to hatcheries, private farms, landing centers, fish processing and marketing facilities.

<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
C.1.12	Prepare training materials and technical documentation for training at various levels in Urdu and other local languages.	Federal and Provincial/Areas Fisheries Depts, National Book Foundation, publishers, Ministry of Education, fisheries training centres (Karachi and Lahore)	1-2 years	Federal and Provincial/Areas governments, donor agencies, Ministry of Education, fisheries training centres	Key training materials and technical documents and translated into Urdu by the end of year 1, and in other local languages by year 2.	The materials should also be provided in local languages because in most cases common farmer understands just one language.
C.1.13	Ensure equal access and opportunities to men, women, disabled and minorities in accessing training, skill enhancement programs and extension activities.	Fisheries and Provincial/Areas Fisheries Depts, NGOs District Governments, CBOs, UNIFEM, Ministry of Women Development, Social Welfare and Special Education	1-3 years, continuous thereafter	Federal and Provincial/Areas governments, donor agencies	Women, minorities and disabled are included in all training and extension programs by the end of year 1. 30% participation from women and 30% from minorities is achieved by the end of year 2 in all programmes related to fisheries and aquaculture.	“Positive discrimination” measures to ensure participation by women and minorities may be applied.
C.1.14	Improve lodging and boarding facilities at training centers.	Provincial/Areas Fisheries Depts, BCDA, SCDA, fisheries training centres (Karachi and Lahore)	2-3 years	Federal and Provincial/Areas governments, donors agencies.	Boarding and lodging facilities at all existing fisheries training centres are improved by the end of year 2. Adequate facilities are established in new training centers by the end of year 3.	

<b>PO C.2 Improve extension services for the fisheries and aquaculture sectors</b>						
<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeframe</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
C.2.1	Where required, improve existing, and establish new mobile extension units at Tehsil level.	Provincial/Areas and district governments, NGOs, private sectors	2-5 years	Federal and Provincial/Areas governments, donor agencies	Extension vans (at least 1-2 with training equipments (audio visuals) and motorcycles (5-10) are acquired and available for trained staff in each HPZ at the end of year 2. Well trained extension staff for providing extension services are in place by the end of year 2. Mobile extension services are fully in place by year 3. One new mobile unit is established for other districts and new HPZ by the end of year 5.	Mobile units should have facilities to perform water and soil analyses and disease diagnostics. The reach of extension services will be facilitated through cross visits, exposure visits, use of mobile extension officers, the opening of meetings and discussions to fish-farmers and fishers at local fisheries offices.
C.2.2	Raise awareness among fishermen and fish farmers about conservation and sustainable management principles.	Provincial/Areas Fisheries Depts, WWF, IUCN, NACA, district governments, fishermen and fish farmers' organizations, fishing communities, P&D Depts, NACA	1-5 years, continuous thereafter	Federal and Provincial/Areas governments, donor agencies	Awareness programme designed by the end of year 1. Awareness program is launched in 40% of fishing communities and rural villages (in HPZ for aquaculture) by the end of year 5.	Awareness programme could be launched by Provincial/Areas Fisheries Depts at the Tehsil level. Example of NACA/STREAM one-stop aqua shop may be considered.
C.2.3	Broaden the range and relevance of topics for extension to fish farmers and fishermen.	Provincial/Areas Fisheries Depts, district governments, fishermen and fish farmers' organizations, fishing communities, CBOs, NACA	2-3 years	Federal and Provincial/Areas governments, donor agencies, NGOs	Materials on technical and economic aspects of fisheries and aquaculture development are available for extension support in each HPZ by the end of year 2, and in all Tehsils by the end of year 3.	Extension services may concentrate on: - for aquaculture - farm construction, management of integrated farming systems (e.g. polyculture), hatchery management, aquatic plant and freshwater prawn cultures, disease control, medicine and chemical use, post-harvest care and processing technologies, accounting and business development. - for capture fisheries - safety on boats, animal health, cleanliness and hygiene in handling, ecology and conservation etc. Guidelines may be produced for first-time private aquaculture investors. Information needs to be regularly updated and needs to incorporate specifics about markets and aquatic species internationally traded.

<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
C.2.4	Educate and train fish traders on the use of improved fish transportation methods.	Provincial/Areas Fisheries Depts, district governments, fish traders' organizations, FAO	1-3 years	Federal and Provincial/Areas governments, Banks and DFIs	Training for fish trader is started by end of year 2. 30% of middlemen are trained by the end of year 3.	This is linked to Strategy Axis 3 on the reduction of post-harvest losses.

**COMMON ELEMENT D    Enhancement of research and development applied to fisheries and aquaculture**

<b>PO D.1 Enhance support to and improve quality and relevance of research and development applied to fisheries and aquaculture</b>						
<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
D.1.1	Create an independent Fisheries Research Council for marine and inland fisheries and aquaculture research.	Federal and Provincial/Areas Fisheries Depts, PARC/NARC, universities, research organisations	2 years	Federal government, international donor agencies (UNDP, NORAD, CIDA etc)	Fisheries Research Council is established by the end of year 2.	Similar to PARC, located in Islamabad. Instead of establishing inland fisheries research institutes, the FRC should strengthen existing Provincial/Areas and federal Fisheries Depts/institutes.
D.1.2	Initiate (where needed), support and strengthen applied research in academia and research institutions with redefined research agendas matching fisheries and aquaculture development needs.	Federal and Provincial/Areas Fisheries Depts, MFD, CEMB, universities, research institutions, PARC, NARC, NIO, Fisheries Research and Training Institute (Lahore), Fisheries Training Centre (Karachi), private sector, MOST, Zoological survey Dept, (MOE), Ministry of Education, PCSIR, NACA, IOTC, CGIAR, IUCN, WWF	1-5 years, continuous thereafter	Federal and Provincial/Areas governments, MINFAL, Ministry of Science and Technology, donor agencies (ADB, NORAD, CIDA), HEC. Use of funds from on-going Agriculture-Livestock Strengthening Programme (ALSP) may be considered. Agriculture Linkages Programme (PARC) could also be considered	Research programmes of existing fisheries research institutions and universities is reviewed and revamped by the end of year 1. Thematic research is initiated in relevant institutions by the end of year 2. Coordinated research is carried out from year 2 onwards. The remit of the reactivated Fisheries Training Centre in Karachi (cf. APO C.1.1) is extended to encompass research on coastal aquaculture and marine capture fisheries by the end of year 3. The existing Fisheries Research Institute Punjab, Lahore is upgraded to National Inland Fisheries Research Institute by the end of year 5. A network of fisheries and aquaculture-related research centres in Pakistan is established to strengthen collaborative research among existing institutions by the end of year 5. Fishery research capacity in NARC/PARC is strengthened by the end of year 5.	Suggested areas of research: <i>re. aquaculture (fish and shellfish):</i> fish breeding and reproduction physiology, genetics, nutrition and feed formulation, fish health management and disease control, appropriate aquaculture technologies (e.g. pen, cage culture in reservoirs, brackish water aquaculture, saline and waterlogged aquaculture, integrated irrigation and aquaculture, integrated coastal aquaculture), freshwater prawn and poly-culture potential in inland and coastal areas), economics and environmental economics applied to aquaculture systems including economic profitability assessments of local cultivable species, post-harvest management and transformation, optimal water resources use, pollution control, impact of water logging, salinity and seepage on aquaculture practices, domestication of indigenous species for aquaculture purposes, control and elimination of pest species, efficient dissemination of results to fish farmers, etc. <i>re. capture fisheries:</i> survey and stock assessments, population dynamics, fish biology, reproductive physiology and ecology, faunal, floral and ecosystem studies in coastal, marine and inland waters including research on heavy metals and other toxins, bio-diversity conservation,

						environmentally-friendly control of aquatic invasive vegetation, landing status at selected compartments of the Indus system, sustainable use and equitable benefit sharing of fisheries resources, resource economics applied to fisheries, fisheries management, impact of pollution and global environmental change including climate change on fisheries, formulation of sustainable and cheap fish feed for aquaculture, etc.
D.1.3	Increase and target better funding to research centres and institutes involved in fisheries and aquaculture-related research.	Federal and Provincial/Areas Fisheries Depts, universities, research institutions, PARC, NARC, NIO, Fisheries Research and Training Institute (Lahore), Fisheries Training Centre (Karachi), CEMB, private sector, PSF, MOST, Federal and Provincial/Areas Fisheries Depts, MFD, universities, research institutions, PARC, NARC, NIO, Fisheries Research and Training Centre (Lahore), private sector, PSF, MOST, Ministry of the Environment, Ministry of Education	2-5 years	Federal and Provincial/Areas governments, PSF, HEC, PARC, donor agencies, private sector, SMEDA, PSIA, FCS, BOR	Competitive bidding process is used to allocate research funds and high quality research generates funds for future research. Overall funding for fisheries and aquaculture research is increased by 20% by the end of year 5.	This is linked to APO D.1.1. A part of the revenue generated by Fisheries Depts may be pooled in a special research grant which may be provided to institutions and individual scientists for conducting research. Fees collected through MFD issuance of health certificate could be used for fund generation. Capacity development is needed within NARC/PARC to undertake research.
D.1.4	Revamp and update existing university curricula to include conduction of research methods/projects relevant to fisheries and aquaculture sectors' needs.	Public and private universities, colleges, HEC, MFD, Provincial/Areas Fisheries Depts, CEMB, Fisheries Research and Training Institute (Lahore), Fisheries Training Centre (Karachi), Ministry of Education	2-5 years	Federal and Provincial/Areas governments, HEC, NARC, PARC, Zoological Survey Dept. (MOE), donor agencies, universities and colleges	Post-graduate diploma/masters courses require each student to carry out a research project on fisheries and aquaculture by the end of year 2.	Graduates should be capable of carrying out research with professionals and have both theoretical and applied knowledge of fisheries and aquaculture matters as relevant. Private degree awarding institutes should be recognized by HEC. Internships in fisheries agencies of institutions should be considered as part of coursework.
D.1.5	Establish linkages with international research institutes/universities for research and collaborative programs on fisheries and	Federal and Provincial/Areas Fisheries Depts, universities and research institutes (national and foreign), Fisheries Research and Training Institute (Lahore),	3-5 years, continuous thereafter	Provincial/Areas and federal governments, HEC, DFID, CIDA, DANIDA, NORAD, UNESCO, foreign universities/ research	Linkage programmes are initiated by year 3. Collaborations with 5 international centres are formalized by the end of year 4.	e.g. Asian Institute of Technology, Wageningen Agricultural University, Auburn University, Institute of Aquaculture of University of Stirling, and Institute of Marine Research, Bergen, Norway, Fisheries Research Institute, Mymensingh, Bangladesh of research

	aquaculture.	HEC, P&D Depts.		centres.		institutions that may be approached for linkages with universities and fisheries training centres in Pakistan.
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<b>D.2 Develop and support technical research programmes</b>						
<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
D.2.1	Investigate the potential of introducing pearl, bivalve and oyster culture and sea ranching.	Federal and Provincial/Areas Fisheries Depts, PARC, NIO, SMEDA, universities, Fisheries Research and Training Institute (Lahore), Fisheries Training Centre (Karachi), CEMB, private sector, fishing/coastal communities, NACA, SEAFDEC, WorldFish Centre, FAO	2-7 years	Provincial/Areas and federal governments, donor agencies, universities	The potential of aquaculture of pearl, bivalve and oysters, and sea ranching is established by the end of year 2.	Participatory action research with local communities should be carried wherever possible to ensure later uptake of these activities. Research projects on these subjects may also be carried out by postgraduate students as part of their degree.
D.2.2	Establish fish disease diagnostic laboratories and services in Gwader, Dera Murad Jamali (Balochistan) and in other HPZs around the country.	Provincial/Areas Fisheries Depts, universities.	2-6 years	Federal and Provincial/Areas governments, donor agencies, universities	One diagnostic laboratory is established in Gwader by the end of year 2 and one in Dera Murad Jamali by the end of year 5. Laboratories are set up in all HPZ by the end of year 6.	Use of existing training infrastructures in all provinces (in HPZs) and of training centres to be established in Gwader and Dera Murad Jamali (cf. APO C.1.2) should be made to host the disease diagnostic laboratory facilities. Consideration to the establishment of a national disease laboratory may be given at a later stage.
D.2.3	Start a programme for genetic improvement of fish species and hybrids under strict control and regulations.	Provincial/Areas and federal Fisheries Depts, universities (foreign and national), research institutions, PARC, NARC, Fisheries Research and Training Institute (Lahore), Fisheries Training Centre (Karachi), CEMB, NACA, private sector	2-6 years, continuous thereafter	Federal and Provincial/Areas governments, donor agencies, NACA, private sector	Research on genetic improvement is initiated by the end of year 2. Broodstock of genetically improved strains is established by the end of year 3. Demonstration hatcheries of improved strains are open to private fish farmers for hands-on training and information by the end of year 3. At least one model private fish hatchery (receiving technical advice from government) producing seeds of improved fish strains is operational in each HPZ by the end of year 6.	Emphasis should be placed on indigenous carp species. Collaborative research and sharing of findings should be emphasized through the use of the network of fisheries and aquaculture-related research centres in Pakistan (cf. APO D.1.2) and other existing networks and institutions (cf. APO D.1.5).

<b>PO D.3 Increase the reliability of fisheries and aquaculture statistical data collection and analysis country-wide</b>						
<b>APO</b>		<b>People and Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
D.3.1	Implement a comprehensive and harmonized data collection and analysis systems across provinces coordinated by Fisheries Depts at Provincial/Areas level, with reporting to the Federal Bureau of Statistics.	Federal and Provincial/Areas Fisheries Depts, MFD, MINFAL, BCDA, SCDA, FCS, FBS, harbour authorities, FAO, fishermen's organisations, fish farmers, fish markets and auctions	3-5 years, continuous thereafter	Provincial/Areas and federal governments, donor agencies	All provinces harmonise their data collection systems by the end of year 3. Reporting of collected data by Provincial/Areas Fisheries Depts to the FBS takes place on a 6-monthly basis from then on.	Separate data systems for coastal and inland fisheries and aquaculture are needed. The Central Bureau of Statistics has taken over the responsibility of data collection for fisheries. Data collection and analysis should be extended to encompass aquaculture, markets and marketing information, social and economic aspects of fisheries and aquaculture. Current methodologies of sampling should be improved and should be similar in all provinces. Low requirement information systems should be privileged. The data collection system should be harmonized on the model of those used for livestock, agriculture and other sub-sectors as relevant. Accessibility to information should be improved.
D.3.2	Strengthen the capacity for collection in Provincial/Areas Fisheries Depts and analysis of statistical data in the FBS.	Provincial/Areas Fisheries Depts, FBS, FAO	3-5 years	Provincial/Areas and federal governments	Staff responsible for data collection in Fisheries Depts has followed a course/training on the subject by the end of year 3. FBS staff have received regular training for analytical skills upgrading by the end of year 5.	Awareness among Provincial/Areas Fisheries Depts staffs needs to be raised to ensure reliable data collection.

<b>PO D.4 Monitor and ensure that social, economic, marketing and institutional issues are adequately dealt with in relation to fisheries and aquaculture development</b>						
<b>APO</b>		<b>People and Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
D.4.1	Promote the inclusion of social, economic, marketing and institutional subjects in all fisheries and aquaculture research and training programmes.	Federal and Provincial/Areas Fisheries Depts, PERI, SDPI universities, fisheries training centres, Fisheries Research and Training Institute (Lahore), HEC, CEMB	2-4 years, continuous thereafter	Federal and Provincial/Areas governments, universities and fisheries research & training centres, donor agencies	Courses on economic, marketing and institutional issues encountered in fisheries and aquaculture development are designed by the end of year 2. All curricula and training courses include at least one such course by the end of year 3.	Applied research and training is needed in policy development, economics and marketing to cater for the emerging needs of aquaculture and fisheries over time. Capacity building and awareness raising among Fisheries Dept staff, practitioners and students on the importance of taking social and economic issues in fisheries and aquaculture development is urgent. Training of the trainers in foreign universities may be required.
D.4.2	Recruit economists and social scientists in Provincial/Areas Fisheries institutions /departments	Provincial/Areas Fisheries Depts	2-3 years	Federal and Provincial/Areas governments	Post of at least one economist and social scientist is created and filled in all federal and Fisheries Depts by the end of year of 3.	Training/skill development of existing Fisheries Department staff may be carried out in foreign universities.
D.4.3	Ensure that livelihoods and welfare of fishing communities are covered in baseline studies and are monitored over time.	Fishermen's associations, federal and Provincial/Areas Fisheries Depts, district governments, NGOs, CBOs, universities and fisheries training centres, PIDE, SDPI, FAO	2-4 years, continuous thereafter	Donor agencies (e.g. DFID, CIDA, SIDA, EU, ADB etc.) Federal and Provincial/Areas governments	Baseline studies cover livelihood aspects and welfare of fishing communities by the end of year 2. Regular monitoring is carried out every two years from year 4 onwards.	Monitoring of socio-economic uplift in fishing communities is a prerequisite. Participatory research and involvement of local communities is recommended. The contribution of fisheries to the livelihoods of coastal and inland fishing communities needs adequate documenting and appropriate management measures of fisheries resources should be taken in consequence.
D.4.4	Ensure that the environmental, social and economic impacts of aquaculture development towards commercially-oriented operations are regularly monitored.	Federal and Provincial/Areas Fisheries Depts, MINFAL, NGOs, fish farmers organizations, universities and fisheries training centres, SDPI, PIDE, FAO, SMEDA, EPA (as a provider of monitoring information)	3-10 years	Federal and Provincial/Areas governments, donor agencies (e.g. DFID, CIDA, SIDA, EU etc.)	Monitoring system of environmental, social and economic impacts of commercial and non-commercial aquaculture operations is in place by the end of year 3. Regular annual monitoring is carried out from year 3 onwards.	Benefits to small-scale and resource-poor fish farmers should be ensured through appropriately designed partnerships between commercial and artisanal fish producers.

**STRATEGY AXIS 1A Sustainable development of inland aquaculture production**

<b>PO 1A.1 Develop high potential zones for inland aquaculture development</b>						
<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
1A.1.1	Produce maps of high potential zones (HPZ) at Provincial/Areas and district levels and highlight the X most important zones in the country.	Provincial/Areas Fisheries Depts, District governments, Survey of Pakistan, SUPARCO, PARC, private consultant for facilitation of mapping, Irrigation Depts.	1-3 years	Federal and Provincial/Areas governments, FAO, Korean International Cooperation Agency	HPZ maps are prepared by the end of year 2. An appropriate number of high priority zones are agreed by the end of year 2.	Mapping should also be done species-wise.
1A.1.2	Assign government specialists only to HPZ: field staff will be assigned to top priority zones on a regular rotation (every 2-5 years), and reassigned to new zones once aquaculture development in a given zone reaches a sustainable level.	Federal, Provincial/Areas and district Fisheries Depts.	3-5 year	Federal and Provincial/Areas governments, ADB, World Bank, banks and DFIs	A limited number of skilled technical persons is allocated to each HPZ by the end of year 3.	The provision of personal incentives may help retain staff in HPZ.
1A.1.3	Encourage direct external/internal investment in priority towards these zones; with services and inputs provided in priority within the zones.	Federal and Provincial/Areas Fisheries Depts, Finance Depts, private sector, NGOs, SMEDA, BOI, MOI, CBR (export)	1-2 years	Federal and Provincial/Areas governments, private sector, NGOs	Regular/annual investments increases are experienced in HPZ.	
1A.1.4	Consider irrigation schemes with suitable infrastructure for aquaculture in zones with high potential (HPZ).	Federal and Provincial/Areas Fisheries and Irrigation Depts, private sector, PARC, universities, Council for Water Resources Research (CWRR), IWMI, FAO	3-5 years	Federal and Provincial/Areas governments, ADB, World Bank, DFID, CWRR, PARC, PSF	Potential for aquaculture in irrigation schemes is documented by the end of year 3. 30% of irrigation systems is utilized for aquaculture at the end of year 5.	The following districts may be considered: Punjab: Gujranwala, H/Habad, Jhang, M/Gash. NWFP: Swat, Chitral, Charsadda, D.I. Khan. FATA. Other in Badeen, Agrabbar, Saghar, Dardu.

<b>PO 1A.2 Attract private investment in inland aquaculture production (including fish seed/fingerlings, feed and grow-out)</b>						
<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
1A.2.1	[priority]: Provide appropriate financial incentives to attract the private sector in seed/fingerlings production and grow-out operations of commercially-important freshwater species.	Federal, district and Provincial/Areas Fisheries Depts, MINFAL, CBR, SMEDA, EDB, private sector, WAPDA, banks and DFIs, BOI	1-2 years	Federal and Provincial/Areas governments, private sector, banks and DFIs, WAPDA	Feasibility studies are prepared for setting up aquaculture operations and are available to potential private investors by the end of year 2. Financial incentives are approved and implemented by the end of year 2.	Every province should have a clear land lease policy and should make the policy available to the Provincial/Areas Fisheries Depts. Financial incentives are to be negotiated with relevant departments and may include: - provision of low interest rate loans (2%) to acquire aquaculture inputs (seed, medicines, feed), with a period of grace of up to two years and a recovery period extended to ten years <sup>1</sup> . - income tax exemption for a period of 10 years for fish producers (hatchery, feed and grow-out operations). - development of insurance schemes targeted at fish farmers. - installation of tube wells and other hatchery-related equipment at subsidized rates. - reservation of a few bulldozers for the fisheries and aquaculture sectors, and hiring or purchase of bulldozers, tractors and other farm machinery at subsidized rates. - provision of subsidized fuel and electricity rates by WAPDA, and preferential rates for the installation of new electricity lines and transformers (application of agricultural two-part tariff, i.e., tariff D for tube wells meant for agricultural viz farm, hatchery, nursery, is already levied with effect from 01-03-93 - leasing of unused Government and WAPDA land at preferential rates to prospective fish farmers.

<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
1A.2.2	Establish a registration system for fish farms at Provincial/Areas level.	Provincial/Areas and District Fisheries Depts, District governments, SMEDA, Bureau of Statistics, Punjab Economic Research Institute (PERI), Chamber of Commerce, BOR	1-2 years (ongoing after)	Provincial/Areas and district Fisheries depts	List of registered farmers is available with SMEDA, Chamber of Commerce, Provincial/Areas and Federal Governments by the end of year 2.	Random checks of registered farms may be performed.
1A.2.3	Widely publicize nationally and internationally the potential for freshwater aquaculture development in Pakistan.	Provincial/Areas Fisheries Depts., Information dept, SMEDA, Ministry of Commerce, Ministry of Economic Affairs, MINFAL, Foreign Affairs, EDB, Private telecommunication companies	1 year, on-going after	Provincial/Areas Fisheries Depts, EDB	Dissemination and promotion materials are available and used by the end of year 2, domestically and overseas.	<ul style="list-style-type: none"> <li>- Promote and attract joint investment opportunities for aquaculture activities throughout Pakistan (see APO A.1.2 to A.1.6), including trout culture development in NWFP.</li> <li>- Launch publicity campaign through media (e.g. TV, radio and SMS, printed materials) to attract local investors.</li> </ul>

<b>PO 1A.3 Encourage the production of aquatic species able to compete on domestic and international markets</b>						
<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
1A.3.1	[priority #1]: Enhance private sector-led production of seed and grow-out activities for freshwater prawns, catfish and snakehead.	Provincial/Areas Fisheries Depts, research organizations, PARC, SMEDA, private sector, Ministry of Commerce	3-5 years	Private sector, MINFAL, Provincial/Areas and federal governments, ADB, FAO, UNDP, PARC, PSF	One pilot government hatchery (demonstration) of catfish, freshwater prawns and snakehead is established in each HPZ at the end of year 3. Private sector uptake from year 3 onwards. Commercial production (grow-out operations) of value fish (catfish, snakehead) is initiated on a sustainable basis by the private sector at the end of year 3.	Investigate and develop environmentally sustainable production technologies for catfish, snakehead and fresh water prawn. A network for dissemination of quality broodstock to aquaculture may be developed to ensure availability of quality broodstock to private sector hatcheries.
1A.3.2	[priority #2]: Allow priority conversion of waste lands (saline, water-logged) for aquaculture activities.	PARC, Pakistan Atomic Energy, Foreign donor agencies, Provincial/Areas Fisheries Depts, private sector, BOR, Irrigation depts	3-10 years	CIDA, DFID, ACIAR, AUSAID, PARC, ADB, PSDP, private sector, Provincial/Areas Fisheries Depts.	25% of feasible aquaculture sites of water logged and saline areas of Pakistan are brought under fish culture and prawn culture at the end of year 10.	An investigatory service may be established to identify feasible waste land sites.
1A.3.3	Prepare a management plan for aquaculture development on waste lands (saline and water-logged).	Provincial/Areas Fisheries and Agriculture Depts, Irrigation Depts., BOR, IWMI, FAO, PARC	1-3 years	Federal, Provincial/Areas and district governments, Provincial/Areas Fisheries Depts, Irrigation Depts., foreign donor agencies	A short and long term plan for aquaculture use of waste lands is formulated by the end of year 3.	
1A.3.4	Encourage increased production of highly demanded and high value fish for the domestic and international markets, and focus on the propagation of threatened species with potential for aquaculture.	PARC, PSF, SMEDA, private sector, academia (universities), Provincial/Areas Fisheries Depts, EDB, FAO, IUCN	3-5 years	GOP UTF, PARC, PSF, SMEDA, private sector, Higher Education Commission (universities), Provincial/Areas Fisheries Depts, EDB, foreign donors, MINFAL	Research-based results are available for interesting fish culturists at the end of year 1.	Species may include trout and catfish and indigenous freshwater species of high value such as Mahsheer, Shermanhi, Soul and Sanghari. Close links with research institutions to ensure that applied research findings benefit fish farmers are established. Feed for fish feed production is available on a commercial basis. Inputs are available on commercial basis as well as fish seed and fertilizers.

<b>PO 1A.4: Ensure that environmental concerns are fully taken into account in inland aquaculture development</b>						
<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
1A.4.1	Establish and enforce guidelines and standards regarding the treatment of aquaculture pond effluents prior to release in the environment.	Provincial/Areas Fisheries Depts, MINFAL, EPAs, Law Ministry, Parliament, FAO, MOE	2-3 years	Federal and Provincial/Areas governments, EPA, ADB, FAO	NEQS (National Environmental Quality Standards) specific to aquaculture are developed by the end of year 2. Legislative amendments in the Provincial/Areas Fisheries Ordinance Act are made by the end of year 2.	FAO guidelines for responsible aquaculture are followed. Some lessons may be learnt under Best Practice Manuals to be developed under the UTF.
1A.4.2	Promote the adoption of measures to prevent damage to aquatic biodiversity by pollution and environmental degradation.	Provincial/Areas Fisheries Depts, MINFAL, EPAs, Law Ministry, Parliament, UNEP, FAO, private sector, MOE	1-3 years	Federal and Provincial/Areas governments, EPAs, ADB, FAO, NGOs, private sector	Awareness programmes about NEQs are implemented in all relevant provinces/areas by the end year 3, and NEQs implemented by the end of year 3.	Compensation from Ministry of the Environment and EPAs for stoppage of activity under hazardous conditions may be considered.
1A.4.3	Provide inputs in the design indicators for monitoring pollution in water bodies.	Provincial/Areas Fisheries Depts, EPAs, MINFAL, NGOs, UNEP, FAO, universities and research institutions, MOE	1-3 years	Federal and Provincial/Areas governments, EPAs, ADB, FAO, NGOs, universities and research institutions	Fisheries interests are reflected in pollution monitoring indicators. Designed indicators are available for monitoring by the end of year 3.	
1A.4.4	Campaign for industrial and domestic effluents in the vicinity of aquaculture operations to be treated to minimize negative impacts on aquaculture operations.	Provincial/Areas Fisheries Depts, EPAs, MINFAL, law enforcement agencies (police), industrialists, private fish farmers, NGOs, MOE	3-5 years	EPA, DoFs, private fish farmers' associations	Representation is made by the Fisheries Depts to other relevant ministries and departments.	By implementing the above three APOs, this APO will be implemented instrumentally.

**STRATEGY AXIS 1B Sustainable development of coastal aquaculture production**

<b>PO 1B.1 Develop high potential zones for coastal aquaculture development</b>						
<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
1B.1.1	Produce maps of high potential zones (HPZ) at Provincial/Areas and district levels and highlight the X most important zones in the country.	SUPARCO, BOR, Provincial/Areas Fisheries Depts, district government, Survey of Pakistan	1-2 years	Donors, federal and Provincial/Areas governments	Preparation of HPZ maps of Karachi, Thatta, Badin in Sindh, and Lasbella and Gwader in Balochistan are completed by the end of year 2. An appropriate number of high priority zones are agreed by the end of year 2.	
1B.1.2	Direct external/internal investment in priority towards these zones; with services and inputs provided in priority within the zones.	Provincial/Areas Fisheries Depts, local governments, BOR, private enterprises, foreign investors, SMEDA, BOI	2-10 years (continuous)	Private sector including joint ventures, banks and DFIs	Regular/annual investments increases are experienced in HPZ.	Network of services and input providers is created in HPZ. To facilitate investors, government specialists should be assigned to HPZ in priority on a regular rotation (up to 5 years).
1B.1.3	Lobby to ensure that non-aquaculture developmental activities (especially infrastructure) in HPZ make provision for aquaculture activities.	Provincial/Areas Fisheries Depts and other infrastructure-related line ministries, Provincial/Areas Agriculture and Forests Depts, BOR, donor agencies, NIO, Harbour Department in MoD, Karachi University Dept of Oceanography	2-10 years (continuous)	Federal and Provincial/Areas governments	Fisheries sector's views are made known to appropriate Ministries/Departments involved with non-aquaculture development activities.	Any development project taking place in HPZ should seek views of the Provincial/Areas Fisheries Depts.

<b>PO 1B.2 Attract private sector investment in coastal aquaculture production (including seed/fingerlings, feed and grow-out)</b>						
<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
1B.2.1	[priority #1] Facilitate the lease of land for fish farming under Land Lease Policy along the coast.	BOR, Provincial/Areas Fisheries Depts, private sector, BOI	Immediate	Provincial/Areas governments	At least 30,000 hectares of land are allocated to aquaculture.	Detailed survey of the potential areas for land lease to be done in priority.
1B.2.2	[priority #2] Provide appropriate financial incentives to attract the private sector in production of feed and seed/fingerlings, and manufacturing of fish drugs and medicines.	Provincial/Areas Fisheries Depts, WAPDA, CBR, private sector, banks and DFIs, SBP, BOI	1-5 years	Federal government (CBR, WAPDA etc.)	20 private hatcheries and 10 private feed mills at end of year 5 are established.	Financial incentives are to be negotiated with relevant departments and may include: <ul style="list-style-type: none"> <li>- provision of low interest rate loans (2%) to acquire aquaculture inputs (seed, medicines, feed), with a period of grace of up to two years and a recovery period extended to ten years.</li> <li>- income tax exemption for a period of 10 years for fish producers (hatchery, feed and grow-out operations).</li> <li>- development of insurance schemes targeted at fish farmers.</li> <li>- installation of tube wells and other hatchery-related equipment at subsidised rates.</li> <li>- reservation of a few bulldozers for the fisheries and aquaculture sectors, and hiring or purchase of bulldozers, tractors and other farm machinery at subsidised rates.</li> <li>- provision of subsidized fuel and electricity rates by WAPDA, and preferential rates for the installation of new electricity lines and transformers.</li> <li>- restore single-phase electricity connection provided by WAPDA.</li> </ul>
1B.2.3	Establish a registration system for fish farms at Provincial/Areas level.	Provincial/Areas Fisheries Depts, Bureau of Statistics, private sector	1 year (continuous after)	Provincial/Areas governments	Registration of fish farms is mandatory by end of year 1.	Registration will help control theft, monitor farm development and environmental impacts, marketing, and collect statistical information.
1B.2.4	Widely publicize nationally and internationally the potential for coastal aquaculture development in Pakistan.	Federal and Provincial/Areas Fisheries Depts, Ministry of Commerce, EDB, BOI, PSIA, Ministry of Foreign Affairs, Ministry of Information	1-2 years (continuous after)	Federal government, private sector	Dissemination and promotion materials are available and used by the end of year 2, domestically and overseas.	Development of websites and airing of TV and radio programs. Initiatives may included for example: <ul style="list-style-type: none"> <li>- Promote and attract joint investment opportunities in the form of joint-ventures between foreign and local investors/related industries for coastal aquaculture development (see APO A.1.2).</li> <li>- Launch publicity campaign through media (e.g. TV, radio and SMS, printed materials) to attract local investors.</li> </ul>

APO		People & Partnerships	Timeline	Funding	Targets/Indicators	Comments
1B.2.5	Promote environmentally-friendly private sector and NGO uptake of culture of finfish in cages, crab and other lucrative species in HPZ.	Sindh and Balochistan fisheries dept, NGOs, private sector, BCDA, SCDA, NIO, MFA, Forest Depts	2-4 years	Provincial/Areas government, private sector, banks and DFIs, donor agencies (ADB, EU) SCDA, NGOs (WWF etc.)	At least 10 cage culture, 8 crab culture and 2 other lucrative species operations are established by end of year 2.	Environmentally-friendly (mangrove-friendly) methods of culture shall be promoted.

<b>PO 1B.3 Facilitate the establishment of the culture of shrimp, finfish and mud crab in coastal areas of Sindh and Balochistan</b>						
APO		People & Partnerships	Timeline	Funding	Targets/Indicators	Comments
1B.3.1	[ <i>priority</i> ]: Assess, reactivate and maintain facilities at Garho in Sindh for training and demonstration purposes (demonstration and pilot activities).	Sindh Fisheries Dept, SCDA, MINFAL	Immediate	Sindh government, federal government donor agencies (ADB), SCDA	Garho facility will be operational by end year 1.	“Aquaculture and shrimp farming” project under MINFAL is already prepared and includes reactivation of Garho and other facilities.
1B.3.2	Establish environmentally-friendly demonstration pilot-scale shrimp farming operations in Balochistan (in identified HPZ).	BFD, BCDA, NIO, Forest Dept, MINFAL, SMEDA, Lasbella University, MFD, private sector	1-3 years	Federal and Provincial/Areas governments, donor agencies	Establishment of first model farm on Balochistan coast by end of year 2.	“Aquaculture and shrimp farming” project under MINFAL also has a component for this purpose. Another project by BCDA is being submitted for funding.

<b>PO 1B.4 Ensure that environmental concerns are fully taken into account in coastal aquaculture developments</b>						
<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
1B.4.1	[priority]: Guarantee the protection of protected and replanted mangroves of coastal areas from aquaculture operations.	Forest Depts, BCDA, local governments, NGOs, Provincial/Areas Fisheries Depts, SCDA, WWF, IUCN, EPAs, private sector.	Immediate	Provincial/Areas Fisheries Depts, Foreign donor agencies and Provincial/Areas governments	Mangrove cover will be increased.	Mangrove will provide more feeding and breeding grounds for fish and shellfish in creeks
1B.4.2	Develop and enforce measures to prevent damage to aquatic biodiversity by pollution and environmental degradation due to aquaculture operations.	Forest Depts, BCDA, local governments, NGOs, Provincial/Areas Fisheries Depts, SCDA, WWF, IUCN, EPAs, private sector	1-2 years	Federal and Provincial/Areas governments, UNEP, UTF	Rules, guidelines and standards for best aquaculture practices prepared, notified and implemented by end of year 1.	Standards regarding the treatment of pond effluents prior to release in the environment will be included. Surveillance to be done by Fisheries Depts in collaboration with EPAs.
1B.4.3	Establish a regular programme for monitoring of pollution in coastal waters.	EPAs, Provincial/Areas Fisheries Depts, MFD, NIO	2-5 years	UNEP, Provincial/Areas and Federal governments	NEQS for aquaculture effluents to be developed by the end of year 1. Monitoring programme to be established by the end of year 2.	
1B.4.4	Lobby to ensure that no untreated industrial and domestic effluents are released in HPZ (prevention of negative impacts on aquaculture activities).	EPAs, private industries, local governments, Provincial/Areas Industries Depts, Provincial/Areas Fisheries Depts,	1-5 years	UNEP, Federal, Provincial/Areas and local governments, UNIDO, industries and industries associations.	Representation is made by fisheries interests to polluters and relevant government bodies about impacts of pollution on aquaculture production.	Provision of treatment plants for industrial and domestic effluent before release into surrounding environment is necessary. Legal issues to support this APO need to be investigated.
1B.4.5	Ensure that international guidelines regarding the sustainable collection of wild shrimp larvae and management of environmentally-friendly shrimp farming operations are followed.	Provincial/Areas Fisheries Depts, FAO, MFD, private sector	1 year (continuous after)	Provincial/Areas and Federal governments, FAO, donor agencies, NGOs	Guidelines are implemented by the end of year 1.	Guidelines include: - Codes of Practice for Responsible Shrimp Farming. Global Aquaculture Alliance, 1999 ( <a href="http://www.gaalliance.org/code.html">www.gaalliance.org/code.html</a> ). - The International Principles for Responsible Shrimp Farming. World Bank, NACA, WWF, FAO, UNEP, GPA, 2006 ( <a href="http://www.enaca.org/shrimp">www.enaca.org/shrimp</a> )
1B.4.6	Ensure that Ramsar sites located in the Indus Delta and other coastal areas are not affected by coastal aquaculture developments.	Private sector, EPAs, WWF, IUCN, Provincial/Areas Fisheries Depts, Provincial/Areas Forest Depts, Zoological Survey Dept.	Immediate	Federal and Provincial/Areas governments, NGOs.	Ramsar sites protected from aquaculture activities and their bio-diversity maintained.	

**STRATEGY AXIS 2A      Sustainable increase in marine capture fisheries production**

<b>PO 2A.1 Rehabilitate habitats damaged by pollution and environmental degradation</b>						
<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
2A.1.1	[ <i>priority</i> ]: Conserve, replant and improve management of mangroves in coastal areas to protect fish breeding grounds.	Provincial/Areas Forest and Fisheries Depts, NGOs, CBOs, WWF, IUCN, KPT, PQA, SCDA, BCDA	2-10 years	Federal and Provincial/Areas Governments, UNEP, GEF, NEAP, donors agencies	About 50,000 ha of degraded mangrove forest are rehabilitated by the end of year 10. Fish breeding grounds are restored by the end of year 10.	Use of MPAs should be considered. Supportive legislation may be enacted.
2A.1.2	Contribute to the establishment of guidelines and processes for providing compensation by polluters to those affected by pollution based on the polluters pay principle.	EPAs, Law Depts and District Governments, Provincial/Areas Fisheries Depts, Industries associations, BCDA, SCDA	1-5 years	Federal and Provincial/Areas governments, Cleaner Protection Institutes (CPI), UNEP, Industries associations, private industries	Input provided by fisheries sector to establishment of guidelines and processes.	Assumes that principle of polluter pays is accepted
2A.1.3	Lobby to ensure that industrial waste and domestic sewage is treated prior to release into marine environments.	EPAs, federal, Provincial/Areas and district governments, industries associations, NGOs, Provincial/Areas Fisheries Depts, BCDA, SCDA, port and harbour authorities	1-10 years	District governments, donor agencies (JICA, UNEP), trade and Industries associations, private industries, port and harbour authorities	Representation made by fisheries interests.	Similar to APO 1B.4.4 with specific reference to marine capture fisheries. Legal issues surrounding this APO need to be investigated.
2A.1.4	Assess, mitigate and control environmental degradation and pollution on coastal habitats from aquaculture.	EPAs, academia, NGOs, NIO, MFD, WWF, IUCN, ZSD, GDA, KPT, PQA, Harbour authorities	1-5 years	Federal and Provincial/Areas governments, donor agencies, GEF, CIDA, UNEP	Assessment report of high priority areas for the implementation of degradation and pollution mitigation measures is ready by the end of year 2. Mitigation measures are in place by the end of year 3.	The establishment of a Coastal and Marine Water Monitoring Unit under Sindh and Balochistan EPAs should be considered. The assessment may be commissioned to a private consultancy if appropriate.
2A.1.5	Enforce aquaculture and fisheries-related pollution control legislation in coastal areas.	EPAs, Law Departments and District Governments, Industries associations, Provincial/Areas Fisheries Depts, BCDA, SCDA, port and harbour authorities	1-5 years	Federal and Provincial/Areas governments, SNE	Activation and establishment environmental tribunals by the end of year 2. Where necessary, new legislation should be established by the end of year 2, and enacted afterwards.	Pollution control and enforcement may be placed under the authority of the proposed Coastal and Marine Monitoring Unit (see APO 2A.1.4), in partnership with environmental tribunals.

<b>2A.2 Control over-exploitation of marine fisheries resources</b>						
<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
2A.2.1	[priority]: Control illegal, unreported and unregulated (IUU) fishing in coastal and offshore waters.	MFD, Provincial/Areas Fisheries Depts, BCDA, MSA, MFD, FCS, FAO, Law Depts, NIO	1-5 years, continuous thereafter	Federal and Provincial/Areas governments, SNE	Control on IUU is effective by the end of year 5. The number of IUU-related offences is reduced by 50% by the end of year 5.	Control on IUU fishing should include control on poaching by Sindh-based fishing trawlers and purse seiners ('katra' or 'wire' boats) in coastal areas of Balochistan.
2A.2.2	Establish guidelines and promote the use of environmentally responsible fishing practices (following internationally-established codes and standards).	MFD, Provincial/Areas Fisheries Depts, BCDA, NGOs, CBOs, WWF, PFF, FAO, NIO	1-5 years	Federal and Provincial/Areas governments, FAO, NGOs, donor agencies	Guidelines are prepared by the end of year 2. Implementation is effective by the end of year 3. 80 % of fishermen adopt compliant fishing methods by the end of year 5.	Community demand for restricting use of some nets/methods in particular areas (like use of monofilament net in Gwader area and restriction on use of 'thukri' in Pasni) may be supported. Implementation of TEDs may be ensured.
2A.2.3	Control fleet size and fishing capacity.	Federal and Provincial/Areas Fisheries Depts, FAO, FCS, PFF, Law Departments, MSA	1-8 years	Federal and Provincial/Areas governments	Shrimping fleet is reduced to 600 units by the end of year 4. Fishing capacity is reduced by the end of year 8 (exact measure of capacity used to be agreed).	
2A.2.4	Create an exclusion zone for deepsea trawlers in coastal waters.	MINFAL, MFD, MSA, FCS, PFF, FAO	1-2 years	Federal and Provincial/Areas governments	Exclusion zone is created and enforced by the end of year 2.	Fishermen are demanding the exclusion zone to be between 12 and 20 nautical miles.
2A.2.5	Implement a seasonal ban on catching shrimp in coastal areas of Balochistan during the months of May, June and July.	Balochistan Fisheries Dept, BCDA, Fishermen associations, Law Departments	1 year, continuous thereafter	Government of Balochistan	Ban implemented by the end of year 1.	Increase in landings of shrimp catch from Balochistan is expected as a consequence of the measure.

<b>2A.3 Promote sustainable management of marine aquatic resources</b>						
<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
2A.3.1	Conduct resource surveys, species stock assessments in marine (coastal and off-shore) waters.	MFD, Balochistan and Sindh Fisheries Depts, NIO, academia, FAO, BCDA, SCDA, fishermen, communities	1-3 years (regular thereafter)	Federal and Provincial/Areas governments, FAO, international donors (NORAD, SFD)	First stock assessment survey is completed by the end of year 2. Yearly monitoring is continued afterward with regular assessment of key species made periodically.	
2A.3.2	Determine and regulate optimal harvesting levels in marine waters.	MFD, Balochistan and Sindh Fisheries Depts, BCDA, SCDA, academia, PFF, FCS, fishermen, FAO	2-5 years, continuous thereafter	Federal and Provincial/Areas governments	Sustainable harvesting levels are determined by the end of year 2 for key species, and fishing efforts are controlled by year 5.	
2A.3.3	Improve fisheries law enforcement as well as monitoring, control and surveillance services.	MFD, Provincial/Areas Fisheries Depts, BCDA, MSA, FAO	1-2 years	Federal and Provincial/Areas governments	Documented MCS strategy is implemented and results in effective MCS by the end of year 2. Increase % of cases to court resulting in successful prosecution is observed.	Assistance of modern technologies should be used wherever possible and appropriate.
2A.3.4	Adopt and implement FAO Code of Conduct for Responsible Fisheries (CCRF) and related guidelines including the ecosystems-based approach to fisheries management.	MFD, Provincial/Areas Fisheries Depts, FCS, PFF, fishermen and their associations, FAO, NACA/STREAM	1-3 years	Federal and Provincial/Areas governments, FAO, foreign donor agencies	Report on compliance with FAO guidelines for responsible fisheries and ecosystem approaches is available by the end of year 2.	Information related to the CCRF and guidelines should be made available in local language and disseminated to key problem areas.
2A.3.5	Initiate a programme of awareness raising targeted at fishing communities and the general population about marine fish biodiversity, natural fisheries environments, sustainable resource exploitation and conservation.	MFD, Provincial/Areas Fisheries Depts, BCDA, NGOs, CBOs, WWF, IUCN, FAO, Ministry of Information and Broadcasting	1-3 years, continuous thereafter	Federal and Provincial/Areas governments, IUCN, NGOs, UNEP	Awareness programme is prepared by year 1 and effective by the end of year 2.	This is related to APOs C.2.2 and 2B.3.4.
2A.3.6	Establish artificial reefs along Sindh and Balochistan coast.	MFD, BCDA, SCDA, Balochistan and Sindh Fisheries Depts, Pakistan Navy, MSA	3-5 years	Federal and Provincial/Areas governments, SCDA, BCDA, Pakistan Navy, international donors	2 artificial reefs are established along the Balochistan coast by the end of year 4 and 2 artificial reefs are established in Sindh by the end of year 5.	

<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
2A.3.7	Contribute to the development and implementation of a plan for the restoration of the Indus Delta and associated estuarine habitats.	SCDA, Government of Sindh, District Governments, NGOs, academia, IRSA, WAPDA, EPAs, Federal Government, PFF, IUCN, WWF, Pakistan Network for Rivers, Dams and People, IWMI, UNEP	1-10 years	Federal and Provincial/Areas governments, donors agencies (ADB, EU), SCDA, NGOs	Fisheries sector's inrerests are represented and its inputs to plan development and implementation.	Minimum quantity of 10 million acre feet is estimated to be needed below Kotri Barrage. Links should be made to EU-funded SPRIDER project (Sustainable Programme for Rehabilitation of Indus Delta Eco-Region, 2004-2006). This plan should be integrated with the ICZM plan developed under APO A.5.4.
2A.3.8	Establish a system of regular monitoring of various habitats along the coastline, including mangroves, marine turtles and other aquatic biodiversity.	MFD, Provincial/Areas Forest, Wildlife, and Fisheries Depts, WWF, IUCN, SCDA, BCDA, EPAs	1-3 years, continuous thereafter	Federal and Provincial/Areas governments, donors agencies, ADB SCDA, UNEP	Monitoring system is in place by the end of year 3.	Mangroves, marine turtles and other important animals and plant needs special attention for illegal exploitation or damage. Legislation enforcement and prevention of illegal exploitation of aquatic resources may be considered under the remit of the proposed Coastal and Marine Monitoring Unit (see APO 2A.1.4), in partnership with environmental tribunals.
2A.3.9	Create awareness among fishermen on the environmental degradation and pollution impacts of activities such as catching non-target species and fauna, ghost fishing discards, dumping waste oil and solid materials and bilge cleaning.	Provincial/Areas Fisheries Depts, BCDA, SCDA, NGOs, CBOs, EPAs, Ministry of Information and Broadcasting	1 year, continuous thereafter	Federal and Provincial/Areas governments, donors agencies	Program for awareness is initiated by the end of year 2. 50% reduction in catching non-target species and fauna, ghost fishing, waste dumping and bilge cleaning is achieved by the end of year 5.	Information should be disseminated in easily understandable language and format. This is linked to APO C.2.2.
2A.3.10	Lobby for a fresh EIA of construction of Mirani Dam on the mangrove habitat and associated ecosystems of Gwater Bay and Jiwani to be conducted.	MFD, Balochistan Fisheries Department, WAPDA, WWF, IUCN, EPAs, NIO	1 year	WAPDA	Fisheries sector's interests and concerns are represented in the new EIA. Mitigation measures taken by WAPDA are beneficial to fisheries.	An international consultancy firm may be hired for the EIA focussing on impacts on mangroves.
2A.3.11	Establish protected areas and marine parks along the coast.	MFD, Ministry of Environment, Provincial/Areas Fisheries Depts, WWF, IUCN, EPA,s, NIO, academia, CBOs, ZSD, BCDA, SCDA, NCCP,	2-5 years	Federal and Provincial/Areas governments, donors agencies	Two protected areas and one marine park are established and managed along the coast of Balochistan by the end of year 4. One protected area and one marine park are established and managed in Sindh by end of year 4.	About 13 MPAs are already identified in Pakistan. These should be declared as MPAs through notification and legislation. Astola Island can be declared as a protected area in Balochistan. Other areas are to be identified through detailed studies.

		PN, Provincial Wildlife Depts of Sindh and Balochistan, Ministry of Law				
2A.3.12	Promote reduction of non-target catch and habitat destruction by fishing and propose recommendations for minimising impacts.	Provincial/Areas Fisheries Depts, MFD, EPAs, BCDA, SCDA, private sector (fishing vessels)	1-5 years	Federal and Provincial/Areas governments, donors agencies	Report, including recommendations, on non-target catch and habitat impacts is produced by the end of year 2. New by-catch reducing devices are installed by the end of year 4.	Research on by-catch reducing devices has to be carried out as a priority. GOP has agreed to stop trawling in coastal and off-shore waters under the UN General Assembly Resolution.
2A.3.13	Sign up to, and comply with, relevant international agreements.	MFD, MINFAL, FAO, Ministry of Foreign Affairs, MOE	continuous	----	All relevant international agreements are signed by the end of year 2. Compliance with IOTC resolutions and recommendations is immediately ensured.	International agreements include IPOAs on Seabirds, Sharks, Capacity and IUU Fishing, and Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas.

<b>2A.4 Establish sustainable harvesting and utilization of untapped marine resources</b>						
<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
2A.4.1	Promote light fishing and jigging for squids.	MFD, Provincial/Areas Fisheries Depts, FCS, BCDA, SCDA, fishermen.	1-3 years	Federal and Provincial/Areas governments, banks and DFIs, fishermen	Experiment for light fishing and jigging is completed by the end of year 1. The modification of 200 boats for light fishing is completed by the end of year 3.	Light fishing and jigging for squids can be an alternative for shrimp trawlers. Monitoring and surveillance program for this fishery should be established immediately. Soft loans may be provided for the modification of fishing boats through banks or DFIs.
2A.4.2	Introduce tuna longline fishing in Pakistan and tuna value-adding processing.	MFD, Provincial/Areas Fisheries Depts, FCS, fishermen, private processors, EDB, PSIA, BCDA, SCDA, IOTC	1-2 years	Federal and Provincial/Areas governments, banks and DFIs, fishermen, private processors, EDB, EDF, UTF	Experiment for tuna long lining by local boats is completed by the end of year 1. Modification of 300 boats for tuna fishing is completed by the end of year 2. Programme for proper utilization of tuna in suitable value-adding activities is implemented by the end of year 2.	Tuna fishing can be an alternative for shrimp trawlers. Monitoring and surveillance program for this fishery should be established immediately. Soft loans may be provided for the modification of fishing boats through banks or DFIs. Use of dolphin-friendly longlines should be promoted.
2A.4.3	Introduce trap fishing for various shellfish and finfish.	MFD, Provincial/Areas Fisheries Depts, FCS, fishermen, BCDA, SCDA	1-4 years	Federal and Provincial/Areas governments, banks and DFIs	Experiments for trap fishing by local boats are completed by the end of year 1. Modification of 100 boats for trap fishing is completed by the end of year 4.	Crab, lobster and whelk can be caught by traps. Monitoring and surveillance program for this fishery should be established immediately. Soft loans may be provided for the modification of fishing boats through banks or DFIs

<b>2A.5 Promote fisherfolks' safety at sea</b>						
<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
2A.5.1	Promote acquisition and use of minimum safety equipment onboard of fishing boats.	FCS, boat owners, MMD, MSA, Pakistan Navy, Coast guards, MFD, Balochistan and Sindh Fisheries Depts, CBOs	1-3 years	Boat owners, FCS, EDB (EDF), banks and DFIs, MFD	All operational fishing boats have minimum safety equipment on board by the end of year 2.	Mandatory training for captain (nakhuda) on the use of safety equipment should be provided by MFD. Awareness among crews of safety requirements should be raised;
2A.5.2	Extend sea search and rescue facilities to all fishing boats along the coast of Pakistan.	MSA, Pakistan Navy, Coast guards, boat owners, MFD, Balochistan and Sindh Fisheries Depts, CBOs	1-3 years	FCS, boat owners, federal and Provincial/Areas governments	100% of fishing boats can benefit from rescue facility coverage by the end of year 3.	Yearly 'donations' by fishermen towards the maintenance of the rescue facilities could be made

<b>2A.6 Promote sport fishing activities in coastal waters</b>						
<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
2A.6.1	Construct a pier and harbour facilities at Goth Mubbarak for sport fishermen.	City District Government Karachi (CDGK), Sindh Tourism Department, MFD, SCDA, Sindh Fisheries Department, sport-fishermen organizations	1-3 years	CDGK/Sindh Tourism Department, Provincial/Areas government	Harbour developments at Goth Mubbarak are completed by the end of year 3.	
2A.6.2	Advertise sport fishing and organise regular tournaments under government supervision.	City District Government Karachi (CDGK), Federal and Provincial/Areas Tourism Depts, MFD, sport-fishermen organizations, Sindh and Balochistan Fisheries Depts, Ministry of Foreign Affairs	1-4 years	CDGK/Sindh Tourism Department, Provincial/Areas government	A regular publicity programme for sport-fishing tournament is in place by the end of year 4.	Ministry of Foreign Affairs may publicize in international forums.

**STRATEGY AXIS 2B**

***Sustainable increase in inland capture fisheries production***

<b>PO 2B.1 Rehabilitate inland aquatic habitats damaged by pollution and environmental degradation</b>						
<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
2B.1.1	Contribute to the monitoring of impacts of pollution on water regimes and habitats when these have negative impacts on inland fisheries, and suggest remedial measures where necessary.	Ministry of the Environment, Provincial/Areas Fisheries Depts, EPAs/EPDs, Irrigation Depts., NGOs, District governments, industrialists, IUCN, fishermen's associations and communities, industries	2-5 years	Federal, Provincial/Areas and district governments, EPAs/EPDs, GEF, IUCN, UNEP, industries, PARC	Fisheries sector contribution to monitoring is ensured and fisheries sector's interests are included in the proposed remedial measures	Link to APO 2.B.1.2.
2B.1.2	Establish laboratories, including mobile testing units of water, soil and fish tissues.	Provincial/Areas Fisheries Depts, Irrigation Depts., fishermen, industries, EPAs/EPDs, Health Depts., PARC, universities	1-3 years	Provincial/Areas Fisheries Depts.	One laboratory in each district is established by the end of year 3.	Laboratories may be established in existing hatcheries or district/Provincial/Areas offices of Fisheries Depts. Lab testing should include heavy metals, pesticides, poisons and other toxins, BOD and COD. At present private labs do not have the capacity to handle the testing required.
2B.1.3	Contribute to negotiations for the establishment of plants for the treatment of industrial waste and domestic sewage to minimize pollution of inland aquatic environments and externalities to other users.	WASA, Public Health Engineering Depts., Irrigation Depts., industrialists, PCSIR, Provincial/Areas Fisheries Depts, EPAs/EPDs	3-10 years	Federal, Provincial/Areas and district governments, Public Health engineering depts, private sector, ADB, World Bank, UNEP, GEF, other donors as appropriate.	Representations made in negotiations	Some benchmark for sewage treatment depending on city size has to be established.

APO		People & Partnerships	Timeline	Funding	Targets/Indicators	Comments
2B.1.4	Lobby for the implementation of the existing law on pollution control and enforcement of pollution controls in inland water bodies in all provinces.	Federal and Provincial/Areas EPAs/EPDs, Fisheries Depts, Public Health Engineering Depts, Irrigation Depts, Environmental courts and tribunals, law enforcement agencies (police), industrialists, shrimp farmers, BOR	1 year (ongoing after)	Federal and Provincial/Areas EPAs/EPDs, Police (Home Depts), Public Prosecution Depts	Fisheries sector's interests are represented in relevant Ministries/Departments. 50% decrease in the number of violations by the end of year 2. 100% law enforcement by the end of year 5. All NEQS are implemented by the end of year 5.	This concerns in particular the textile and other polluting industries. Resources must be safeguarded against pollution through effective legislation and the implementation of compensation measures (e.g. taxes) to those affected by pollution and environmental degradation based on the "polluter pays principle" for polluting industries, including shrimp farmers. The polluter pays principle was a key notion of the Rio Declaration (1992) and established that <i>"the polluter should, in principle, bear the cost of pollution."</i> (c.f. APO 2A.1.2).
2B.1.5	Lobby for a ban on use of polythene bags.	General public, EPAs/EPDs, WASA, Public Health Engineering Depts, Provincial/Areas Fisheries Depts, Irrigation Depts., media (print and electronic), polythene bag manufacturers, Environmental courts and tribunals, law enforcement agencies (police).	1-5 years	EPAs/EPDs, WASA, Irrigation Depts, manufacturers	50% reduction in use and disposal of polythene bags by the end year 1. Impacts of polythene bags on inland fisheries are reduced.	Raise awareness on the problems they cause when disposed in water ways and water bodies. Only biodegradable bags should be used.
2B.1.6	Give law enforcement powers to Fisheries Department officials with regard to pollution control and equip them with modern technologies.	MFD, Provincial/Areas Fisheries Dept, Law Dept, Parliament.	1-2 years	Provincial/Areas Fisheries Depts	Powers delegated to Fisheries Dept officials by the end of year 2. Fisheries Dept officials are equipped with technology and logistics by the end of year 2.	Provision of uniform and vans ensured with logistic support provided

<b>2B.2 Control over-exploitation of inland fisheries resources</b>						
<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
2B.2.1	Make concerted efforts to enforce the prevention of all forms of Illegal, Unreported and Unregulated (IUU) fishing in inland water bodies.	Provincial/Areas Fisheries Depts, WAPDA, Irrigation Depts, Fishermen and fishermen's organizations, FAO, district governments.	1 year (ongoing after)	Provincial/Areas Fisheries Depts, WAPDA, FAO, IUCN, district governments	50 % reduction of IUU fishing is achieved by the end of year 3.	Establish and enforce a ban on using small-mesh nets for catching under-sized fish and seed from natural water bodies for aquaculture and other uses. Implement selective fishing gear on boats. Promote the use of silk nets among fishermen and phase out nylon nets.
2B.2.2	Conduct resource surveys, and species stock assessments in inland waters.	Provincial/Areas Fisheries Depts, Zoological Survey of Pakistan, Irrigation Depts, WAPDA, PARC, universities, fishing communities	3-5 years	Provincial/Areas Fisheries Depts, PARC, universities, ADB, World Bank, Common Wealth, FAO, GEF, CIDA, JICA, NACA	25% of inland waters are surveyed and database is established by the end of year 5.	
2B.2.3	Set catch limits in freshwater bodies based on MSY.	Provincial/Areas Fisheries Depts, district governments, fishermen and contractors, PARC, universities, WAPDA	2-3 year	Provincial/Areas Fisheries Depts, district governments, PARC, universities, WAPDA	MSY is estimated for 25% of all provinces water bodies and minimum catch limits are established accordingly by the end of year 3.	Data for MSY estimates needs to be available.
2B.2.4	Prepare and implement a plan for the management and sustainable exploitation of each national water body based on the FAO Code of Conduct for Responsible Fisheries (CCRF) and related guidelines.	FAO, Provincial/Areas Fisheries Depts, PARC, universities, fishermen and fishing communities, NGOs, NACA, WAPDA, Irrigation Depts.	2-5 years	Federal and Provincial/Areas governments, PARC, universities, FAO, foreign donors, UNDP	2 management plans developed and implemented each year for all provinces/areas.	External donor assistance is required. In each successive year, each province would prepare 2 management plans (covering different species or key water bodies) thereby progressively increasing the total %of fishereis being managed by such plans.
2B.2.5	Implement control measures from outlet canals to prevent fish from escaping and increase productivity of canals.	Provincial/Areas Fisheries Depts, Irrigation Depts, fishermen, WAPDA	2-5 years	Provincial/Areas Fisheries Depts, Irrigation Depts, WAPDA	10% of the canals are equipped with control measures by the end of year 5.	Study feasibility of control measures from out-let canals so that water flow may not be decreased.

<b>2B.3 Promote sustainable management of inland aquatic resources</b>						
<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
2B.3.1	Monitor the spread and impact of introduced and transplanted such as Tilapia and Chadu (an indigenous species) on indigenous species, and of invasive plant species such as <i>Salvinia molesta</i> on inland water bodies.	Provincial/Areas fisheries depts., PARC, universities, IUCN, FAO, WAPDA	2-5 years	IUCN, WWF, Provincial/Areas Fisheries Depts, PARC, universities, FAO	Impact of two exotic species is studied in each province by year 5.	<i>Salvinia molesta</i> problem on Keenjher Lake in Sindh.
2B.3.2	Promote the use of environmentally-friendly biological, chemical and mechanical methods to control the spread of invasive, non-indigenous species.	Provincial/Areas Fisheries Depts, PARC, universities, fishing communities, NGOs, WAPDA, FAO, Ministry of the Environment	3-5 years	Federal Ministry of the Environment, Provincial/Areas Fisheries Depts, PARC, NGOs, CIDA, DFID, GEF, UNEP, ADB, World Bank	Spread of exotic species brought under control by the end of year 5.	Biological controls used must be indigenous species. Research will be needed in this area.
2B.3.3	Implement ecosystems-based approaches to inland fisheries management when and where practically possible.	Provincial/Areas Fisheries Dept, Ministry of the Environment, EPAs/EPDs, WAPDA, Irrigation Dept, fishermen communities, fishermen, NGOs, FAO, PARC, Zoological Survey of Pakistan	5-10 years	Provincial/Areas governments, NGOs, foreign donors (FAO?, CIDA, JICA, DFID, ADB, World Bank, Islamic Development Bank), PARC	Fisheries ecosystem-based plan is prepared and implemented by the end of year 3.	Management of the water bodies is under the responsibility of established fishermen's associations/ fishing communities.
2B.3.4	Initiate a programme of awareness-raising targeted at the general population and at fishing communities about freshwater fish bio-diversity, natural fisheries environments and sustainable resource development.	Provincial/Areas Fisheries Depts, NGOs, district governments, FATA, Fisheries Society of Pakistan, Zoological Survey of Pakistan, Ministry of Information.	3-10 years	Federal and Provincial/Areas governments, NGOs, foreign donors (FAO, ADB)	Awareness-raising materials prepared and used in all provinces/areas by the end of year 5.	This is related to APO C.2.2 and 2A.3.5).
2B.3.5	Restock freshwater bodies with seeds/fingerlings of commercially-important carp species.	Provincial/Areas Fisheries Depts, private sector, fishermen communities, NGOs, WAPDA, PARC	1-5 years,	Federal, Provincial/Areas and district governments, FATA	Infrastructures for seed production available and functional by the end of year 3 for restocking purposes only. Fish seed stocking programme initiated by year 4.	Purchasing fish seed from private hatcheries must be considered. Ensure that scientific protocols of restocking are followed to restore/enhance bio-diversity. Important instrument for maintaining ecosystems. This requires background research on appropriate strategies and ecosystem status.

<b>APO</b>		<b>People &amp; Partnership</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
2B.3.6	Establish fish sanctuaries in all provinces for endangered species.	Provincial/Areas Fisheries Depts, fishermen communities, fishermen, Irrigation Depts, Provincial/Areas Wildlife Depts, Tourism Depts, WWF, IUCN, FAO	3-5 years	FAO, Provincial/Areas Fisheries Depts, District governments, NGOs, foreign donors, IUCN	At least 4 or 5 new fish sanctuaries are established in each provinces at the end year 5.	Pockets of River Swat and River Kunhar for the fisheries of the cold region of NWFP may be considered. Balochistan may be an exception as only one or two areas may be suitable for fish sanctuaries.
2B.3.7	Declare zones up to 1 km up and downstream of headworks <sup>4</sup> and barrages as reserved areas for fish breeding and survival.	Irrigation department, Provincial/Areas Fisheries Depts, fishermen, fish contractors, NGOs	1-3 year	Provincial/Areas governments, fish contractors, NGOs	Non-fishing protected zones are declared at all barrages by the end of year 3.	
2B.3.8	Establish a registration system for all fisherfolks.	Provincial/Areas Fisheries Depts, fishermen communities and fishermen organizations, district governments, BOR, CBR	1-2 years	Provincial/Areas DOFs and district governments	A directory of registered fishermen is available by the end of year 2.	

<sup>4</sup> Under existing laws, fishing is not allowed 100 m up and downstream of headworks and barrages.

<b>2B.4 Establish sustainable exploitation of untapped inland resources</b>						
<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
2B.4.1	Ensure that hatcheries in all provinces enhance biodiversity through the production of fish seed of local species, such as Mahaseer, Sher mahi, Soul, Singahri, Khagga, Malli.	Provincial/Areas Fisheries Depts, district government, fishermen communities, PARC, universities	3-5 years	Provincial/Areas DOFs, PARC, universities, foreign donors (research support)	Fish seed of catfish species is available for stocking in national water bodies by the end of year 5.	Involvement of the private sector should be promoted and will be possible as fish seed becomes available for culture of these species.
2B.4.2	Stock fingerlings of local species in natural water bodies.	Provincial/Areas Fisheries Depts, district government, fishermen communities, PARC, universities	5-10 years	Provincial/Areas DOFs	50% of natural water bodies are stocked with the seed of local catfish species at the end of year 10.	Hatchery seed production will be increased to rehabilitate stocks in all national water bodies, including some of the areas previously neglected such as Hamal and Ghaibee Dero Lake and lakes of Larkana District. Prior assessment of environments is required before restocking programme. This is complemented by APO 2B.3.5.
2B.4.3	Investigate the potential to enhance cold-water fisheries.	Provincial/Areas Fisheries Depts, district government, fishermen communities, PARC, universities	2-5 years	Provincial/Areas DOFs, PARC, universities, foreign donors (research support)	Potential for cold-water fisheries is established at the end of year 5.	

<b>2B.5 Promote sport fishing activities in inland waters</b>						
<b>APO</b>	<b>Plan Objectives</b>	<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
2B.5.1	Dedicate water bodies to sport fishing activities.	Provincial/Areas Fisheries Depts, District governments, Provincial/Areas Dept of Tourism, Information department, sport fishing associations, private sector	2-5 years	Tourism department, Provincial/Areas and district governments, private sector.	At least one water body in each district is earmarked for sport fishing.	Tourism department and line departments to coordinate with private sector for promotion of fishing sports. These water bodies will properly stocked by the Fisheries Department. Water bodies for sports fishing identified; provision of facilities at the identified bodies; promotion of sports fishing activities through the tourism department; private sector actively involved for establishment of facilities at identified sites; annual sporting events at the national level for promotion of sports fishing.
2B.5.2	Rationalise the cost of license fees and establish a fool-proof system of collection of license fees.	Provincial/Areas Fisheries Depts, District government, Provincial/Areas Finance Dept, sport fishing associations, sport fishermen	1-2 year	Provincial/Areas Finance Dept.	Cost of license is reduced by 50% and 100% collection is achieved by the end of year 2.	
2B.5.3	Advertise sport fishing and organise regular tournaments under government supervision.	Provincial/Areas Fisheries Depts, Tourism Depts, Information Dept, sport fishing associations, sport fishermen, district governments, media/press	1-2 years	Provincial/Areas Fisheries Depts, district governments, Tourism Dept, sport fishing associations	Sport fishing competitions are advertised and organized in all provinces by year 3.	
2B.5.4	Ban the use of fish seed as bait for sport fishing.	Provincial/Areas Fisheries Depts, district governments, sport fishing associations, sport fishermen, Law Dept (Parliament)	2 years	Provincial/Areas Fisheries Depts	Zero use of fish seed as bait by the end of year 3.	Legislation to impose and enforce the ban needs to be updated.

### STRATEGY AXIS 3 *Resolving post-harvest issues*

PO 3.1 Improve the handling and preservation of fish and aquatic products						
APO		People & Partnerships	Timeline	Funding	Targets/Indicators	Comments
3.1.1	[priority]: Create auction and market centres for inland and marine fish products, at major inland fisheries centres (at district level) and fishing harbours respectively.	Fish harbour authorities, district governments, Provincial/Areas Fisheries Depts	3-5 years	Federal, Provincial/Areas, district governments, donor agencies (ADB, World Bank)	An auction centre is created at each major fish marketing area (>1 tonne per day in the season); markets are created in each population centre of more than 100,000 by the end of year 5.	Seek Provincial/Areas governments' inputs. Strong demand market/auction facilities at Dera Murad Jamali.
3.1.2	Build landing facilities along the coast and construct landing jetties at major inland fish landing areas and at other major freshwater fish producing water bodies.	Federal, Provincial/Areas and district governments, BCDA, SCDA, Tourism Depts, Ministry of Ports and Shipping	3-7 years	Federal and Provincial/Areas government, donor agencies (ADB, Islamic Development Bank, World Bank, EU)	Due consideration is given to suggested sites. Landing facilities and jetties are available at all suggested sites of the coast by the end of year 7 by the end of year 7.	Seek Provincial/Areas governments' inputs for Punjab. Suggested sites are Keti Bundar, Shah Bundar, Goth Mubbarak and Sonara (Sindh coast); Gaddani, Damb, Kund Malir, Ormara, Kalmat, Sur, Gwader (West Bay); Phushukan, Ganz, Goth Mubarrak, Jiwani, Kappar, Shumal Bundar and Chur (Balochistan coast) and at Chashma Barrage, Keenjhar Lake, Manchar Lake, Tarbala Dam and others.
3.1.3	Improve existing harbour facilities, including regular dredging and expansion.	Fish harbour authorities, district governments, MPS, KPT	Immediate, 1-3 years	Federal, Provincial/Areas and district governments, and donor agencies	Improved facilities are available at Karachi, Korangi, Gwader, Ibrahim Rehri and Pasni Fish harbours by the end of year 3.	In consultation with Provincial/Areas governments.
3.1.4	Establish pre-processing industries (peeling sheds) in Karachi.	Provincial/Areas government of Sindh, FCS, KFHA, MFD, BIFCS, EDB	Immediate, 1-3 years	Government of Sindh, Export Promotion Bureau, EDF	A minimum of 150t per day per unit are processed by the end of year 3.	

<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
3.1.5	Assist in installation of quality ice making machines on board of fishing vessels and refrigeration systems on board of fishing boats involved in longer fishing operations.	FCS, boat owners, MFD, SMEDA,	1-5 years	Banks and DFIs	Machines/systems are installed on 1,000 boats by the end of year 2, and on all boats by the end of year 5 (and systematically afterwards).	Federal government has a demonstration project in place; soft loans should be provided to boat owners to purchase equipment.
3.1.6	Install quality ice making plants and cold storage facilities at all major fish harbours.	MFD, KFHA, PFHA, KOFHA and other harbour authorities, BCDA	1-3 years	Banks and DFIs	1 ice plant of 200 t/day capacity is available at each major fish harbour. 1 cold storage of 300 t capacity is available at the end of year 3.	Final agreement on daily capacity to be based on further analysis of vessel and post harvest requirements.
3.1.7	Facilitate the acquisition and upgrade of fish holds for larger boats and insulated boxes on smaller boats.	FCS, boat owners, MFD, SMEDA	1- years	Banks and DFIs	2,500 boats per year are equipped with fish holds or insulated boxes by the end of year 3.	
3.1.8	Create/improve quality control in the landing centres, including promoting the use of fish crates and insulated boxes.	MFD, harbour authorities, FCS, BCDA, SCDA, BFD	1-3 years	Federal and Provincial/Areas governments, EPB, FCS	Routine inspections for quality control are carried out. 10,000 – 15,000 boxes of 70-100 litre-capacity are used daily by the end of year 3.	Inspections mandatory under the law.
3.1.9	Attract private investment in building and expansion of storage facilities at inland/coastal landing centers and near market centers.	Private sector, harbour authorities, district governments, MFD, BCDA, SCDA, SMEDA	1-5 years	Private sector	Cold storage units exist in major landing facilities / sites by the end of year 7.	Harbour authorities at local government should ensure to prioritise provision of required utilities facilities.
3.1.10	Allow for the duty free import of equipment (fish boxes, reefer vans etc.).	Central Board of Revenue, Engineering Development Board, federal and Provincial/Areas Fisheries Depts,	1-2 years	---	Tax exemption is available within sector by year 2.	Legal issues and implications should be examined in view of WTO agreements.
3.1.11	Ensure adequate supply of potable water to landing centres, especially to Karachi Fish Harbour.	KFHA and other rharbour authorities, Provincial/Areas level water boards, irrigation departments	1-3 years	Harbour authorities, federal and Provincial/Areas governments, EDB through EDF	Availability of potable water at all landing centres by year 5.	Possibility of supply of water being provided through desalination should be examined.

<b>3.2 Add value (transformation/processing) to aquatic products</b>						
<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
3.2.1	Improve by-catch utilization.	MFD, PCSIR, private sector	3-5 years	PSI, PARC, banks and DFIs	50% of by catch is converted into new products by the end of year 5.	
3.2.2	Promote the establishment of private value-adding processing facilities.	MFD, Provincial/Areas and Federal Fisheries Depts, private sector, SMEDA	1-4 years	Banks and DFIs	Processing facilities exist in all major landing facilities / sites by the end of year 5.	This should be demand-driven. Value addition trout processing in Swat should be considered.
3.2.3	Establish demonstration facilities for value addition and improved processing.	MFD and Provincial/Areas Fisheries Depts	2-3 years		Demo facilities for value addition are established at all four existing fisheries training centres and the training courses are conducted by the end of year 2.	
3.2.4	Raise awareness about small-scale fish processing methods.	Federal, Provincial/Areas and district governments	1-2 years	Provincial/Areas and federal governments	Easily accessible printed and other information is available in all HPZs by the end of year 3.	

<b>3.3 Improve transportation of aquatic products</b>						
<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
3.3.1	Promote the use of insulated boxes and refrigerated carriers through provision of soft loans from banks and FDIs.	Fish traders and fish transporters, Provincial/Areas and Federal Fisheries Depts, banks and DFIs	1-3 years	Banks, DFIs, Citizen Community Boards in district governments	100% of fish is transported in insulated or refrigerated carriers by the end of year 5	Legislation for mandatory transportation of fish in insulated boxes and refrigerated carriers needs to be enacted. A system of rental of refrigerated vans through fishermen and fish farmers' associations and cooperative societies may be examined.
3.3.2	Lobby for the construction and improvement of road links from harbours and landing centres to the coastal highway and urban centres.	Local governments, Provincial/Areas Building and Road Depts, Ministry of Communications (Federal), NHA, BCDA, SCDA	5 years	Federal and Provincial/Areas governments, donor agencies (ADB)	Representations are made to appropriate Departments/Ministries	Priority should be given to upgrading and rehabilitating roads leading to KOFH (Korangi Fishing Harbour). Oman government is providing funding for construction of roads in Balochistan.

<b>3.4 Improve commercialisation of aquatic products</b>						
<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
3.4.1	Improve hygiene conditions in all fish markets.	Local governments, Fish Harbour Authorities, FCS, Traders associations, Ministry of Health	2-3 years	Local government and Fish harbour authorities.	A notable decline in fish rejected/unsold in markets because of poor quality is observed by the end of year 3.	Facilities may include toilets, running water and fish stalls at low rental.
3.4.2	Review the legislation pertaining to the catching and sale of fish during the months of July and August.	Provincial/Areas Fisheries Depts and local governments, fish traders associations	1 year		Law is reviewed and amended if appropriate.	Sale of farm fish year round may be examined.

<b>3.5 Improve access of aquatic products to international markets</b>						
<b>APO</b>	<b>Plan Objectives</b>	<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
3.5.1	Update fish quality control laws to ensure compliance with those of importing countries as well as ensure compliance of commodities with internationally-recognised standards of food safety and trade (e.g. WTO agreements, CODEX Alimentarius).	MFD, Provincial/Areas Fisheries Depts, PSIA, Ministry of Law	1-2 years	UNIDO, Fisheries Depts	National law is harmonized by the end of year 2.	For HACCP, aquaculture products may be considered for inclusion in the legislation.
3.5.2	Address comprehensively quality issues and establish quality assurance programmes (e.g. HACCP) for freshwater and marine fisheries and aquaculture products.	Processors, MFD, Provincial/Areas Fisheries Depts, Pakistan Small Industries Association (PSIA), EPD	2-3 years	Processors, MFD, Fisheries Depts' own resources	Quality control programmes are in place and Competent Authority working effectively by the end of year 3.	
3.5.4	Evaluate the impact of WTO and TRIP regimes on fishing, and aquaculture industries.	Ministry of Commerce, MINFAL, Provincial/Areas Fisheries Depts, fish traders associations and farmers, Ministry of Law, Intellectual Property Organization, PARC	1 year	Federal government, MINFAL	Study is completed by mid-2007.	
3.5.5	Increase the number of export points.	CBR, Ministry of Commerce, MFD, CAA	1-4 years	MINFAL	Number of direct export points is increased to 10 by the end of year 4.	Priority should be given for direct export from Gwader on the Pakistan/Iran border.
3.5.6	Establish a fish export processing zone at all major fish harbours.	Ministry of Commerce, MFD, PSIA, fish traders associations, EPZA, MOI	2-5 years	Federal government, EDB,	EPZ is established at Karachi, Korangi, Pasni and Gwader by the end of year 5.	

<b>APO</b>	<b>Plan Objectives</b>	<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
3.5.7	Create a separate section/unit under the Export Development Board dealing specifically with fisheries and aquatic products.	Ministry of Commerce and EDB, MFD, Provincial/Areas Fisheries Depts, MINFAL, exporters, FAO	2 years	Federal government, Ministry of Commerce and EDPB	A separate section/unit for fisheries and aquatic products is created under EDB by the end of year 2.	The example of the Indian MPEDA (Marine Products Export Development Authority) created to give full attention to fish export and related matters, may be given some consideration. This 'cell' would coordinate the efforts and activities of fish producers, processors and exporters, facilitate export procedures, monitor and disseminate information on ongoing international developments in trade and associated regulatory frameworks, and provide information to the commercial counsellors of Pakistan Embassies around the world.
3.5.8	Provide specific credit schemes to processors to facilitate compliance with national and international quality control requirements.	PSIA, PCSQA, MFD	2-3 years	Banks and DFIs,	Credit line for this purpose is established by the end of year 2 and funds are disbursed by the end of year 3.	
3.5.9	Draw on lessons from existing non-fisheries initiatives and the Corporate Social Responsibility (CSR) agenda in identifying ways to minimize the potential marginalisation of the poor through mitigating measures.	FCS, local governments, federal, Provincial/Areas and local governments, Fisheries Depts	1-3 years	International donor agencies, Provincial/Areas governments	Study is completed and recommendations are adopted for the betterment of poor people by the end of year 3.	

<b>3.6 Improve dissemination of market and product information</b>						
<b>APO</b>		<b>People and Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
3.6.1	[priority] Monitor the effects of carp imports on prices and marketing.	Provincial/Areas Fisheries Depts, MFD, MINFAL	Immediate	Fisheries Depts' own resources	Study is completed by end of year 1.	Consumption preferences for carps should be taken into account.
3.6.2	Use most appropriate technology to reach producers/traders with market information.	Agriculture Marketing Committee at District level, local governments, Provincial/Areas Fisheries Depts, Provincial/Areas Agriculture Marketing Depts, Agriculture Marketing and Grading Dept.	1-2 years	Federal, Provincial/Areas and local governments.	The price of fish is disseminated daily.	The price of fish should be included among the price list of agricultural commodities issued on a daily basis by the Agriculture Marketing Committee at the District level. Appropriate technology may include radio, television, mobile phones and computers (web-based information).
3.6.3	Identify international market niches for captured and cultured aquatic products.	EDB (proposed Fish Export Cell), PSIA	1 year (regular updates afterwards)	EDB, UTF	New market niches are identified by the end of year 1.	Quantitative target should be defined by proposed UTF study.
3.6.4	Develop a system of minimum price for fish and aquatic products on the model of other major agricultural commodities (e.g. cotton, wheat, mutton and chicken).	Marketing committees, district governments, fish traders' associations, Provincial/Areas agriculture marketing department,	1 year then regular activity	Local government	Minimum price system is established by end of year 2.	Modalities related to the application of price support measures need to be further discussed.
3.6.5	Monitor consumers' fish preferences, and provide subsequent advice on improved marketing, market segmentation, buyer requirements, and other characteristics of potential markets.	Research institutions such as PARC, PERI, EPB, proposed fish export cell, business and economic research institutes	Initiated within one year then regular activity	UTF, Federal, Provincial/Areas, and local governments, fish farmers' and processors' associations	Consumer preference studies are completed by the end of year 1 and updated regularly.	

<b>APO</b>		<b>People &amp; Partnerships</b>	<b>Timeline</b>	<b>Funding</b>	<b>Targets/Indicators</b>	<b>Comments</b>
3.6.6	Investigate the potential for alternative low-price fish products for domestic markets.	MFD, Provincial/Areas Fisheries Depts, PARC, PSiAR, and other research institutions	2 years	PSF, PARC and other Pakistani funding agencies	Potential alternatives are identified by year 2.	Include small-sized fish among the species considered.
3.6.7	Enhance the reputation of aquatic products of Pakistan origin on international markets.	Ministry of Commerce, EDB, Ministry of Foreign Affairs, Ministries of Industry and Trade	Immediate	Ministry of Commerce, Foreign Office, embassies, MINFAL, Ministry of Industry, Trade and Special Initiatives	Increase in requests for information is observed. Seafood shows, and other market promotional tools identified by proposed UTF study, are attended.	
3.6.8	Generically advertise the health benefits of fish consumption.	Federal and Provincial/Areas Ministry of Health, Ministry of Education and MINFAL	Immediate and regular activity	Federal and Provincial/Areas governments	Domestic market promotion tools are used regularly from year 2 onwards.	