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Foreword

The first fisheries and aquaculture National Plan falls in a delicate transition period where all active segment are engaged in restoring the productive capacity of the industry. In fact, production from the capture sector in last decade has passed from 10.400 tons landed in 1990 to 5.000 tons, which have been landed in 1999.

Such a decline has been monitored continuously by the government and by the public administration deputed to fisheries and aquaculture management, and a number of measures have been taken to offset the decline of the industry. The lack of a coherent planning framework, within which government actions were taken, partly justifies the impossibility to reverse the negative trend. This plan is a first attempt to bring in a unique planning document much of the information available on Albanian fisheries and aquaculture, where objectives, tools and means have been identified and made consistent with the need to restore and rehabilitate most of the Country's fishing and aquaculture industry.

Albanian natural resources represent an important asset, which, if properly utilised, could allow the increase of national wealth, and also those involved with its exploitation would benefit by increasing their personal income. In fact, the existing large availability of internal waters, coastal lagoons, fish stocks and coastal areas, all represent excellent cases of natural resources to be utilised in a more efficient way. This can only happen if financial resources, training, management rules, fiscal policy, international co-operation and the like will be available to investors and those, in general, who intend to be involved with the utilisation of the Country's natural resources.

Of course, on behalf of future generations, the planning framework is also consistent with the principles of responsible fishing and aquaculture and sustainable exploitation of the resources. This is intended to be achieved by securing the proper equilibrium between fishing effort, by fleet segments, and available biological resources in case of fisheries, while appropriate management schemes will be introduced for what internal waters and coastal lagoon will be concerned. This approach, implicitly, considers the need to introduce and maintain a fair equilibrium between fishing and environment, which is essential to secure a policy, based on biological resource safeguard and sustainable growth.

Another aspect of the Albanian fishery policy concerns the need for improving the convergence with the Common Fishery Policy adopted by the European Union. In this respect, the importance of establishing long standing links with EU, either for market reasons or from a more general perspective, have been considered. In particular, the fulfilment of rules concerning hygiene and healthy, actually limiting exports of Albanian produce to EU markets have been given the right priority in the list of measures to be activated in the short period. The respect of this rules involves the development model of Albanian fishing industry, by upgrading the structures installed or to be realised, as well as the way of maintaining on board and trade the product, processing the raw material in factories, growing cultured species.

Of course, the achievements of the targets, which have been envisaged in the Plan, define a new and more efficient productive system, which will not be possible without a close collaboration between the Public Administration and all producers' categories involved in the industry.

In this respect, the social and economic strengthening of producers' association represent a target in itself, since the whole management policy requires the collaboration of categories and their compliance in respecting the rules which will be introduced. The management of some tools, which have been identified, such as the Micro Credit Scheme, will be best implemented if the producers' association will assume the direct responsibility of the programme. On the other hand, it will be also important to define a legal framework, which will be easy to enforce and clear enough to comply. An example can be found in the case of the licensing scheme and property rights system in inland waters management or in case of lagoons management where investments are difficult to realise given some uncertainties about the property rights and the occurrence of illegal fishing in many cases.

All cases now shown are also examples where collaboration between producers' associations and the Public Administration could allow excellent results and an increasing compliance from resource users could be expected.

Those now described are the principles underlying the drawing of this first Plan of the Albanian fishing and aquaculture industry. The Plan will be divided in three parts, each of them will have a specific importance for the industry. Of course, the Plan have a final part identifying the financial resources available for the implementation of the measures and actions envisaged. This is due to the actual system of priorities of the Albanian economy, where fishing and aquaculture are not on the top of the list and this has to be recognised, if targets have to be correctly set by the Plan. The final part incorporates the actual difficulties and shows; instead, tables where the measures and actions, which have been identified, are associated with some of the existing international co-operation programmes. It is believed that once principles have been clarified and targets are definite, the choice of the correct financial programme and its detailed drawing and implementation, according to the interest of the Country, would give more efficiency to each partner's action.

PART 1

SECTION I

1. MARINE FISHERIES

The prime objective of the Fishery Management Plan is to ensure the rehabilitation of Albanian Fisheries through the development of a sound policy based on the renewal of the fleet according to the Code of Conduct principles. Sustainability of exploitation of Albanian aquatic resources has to be *rational* and *accountable*. The term *rational* means that the fleet has to be allocated depending on the state of the stocks, while the term *accountable* means that fishing activity must be followed in a way that management measures have to be undertaken according to the information emerging from a systematic monitoring of the fleet.

The overall strategy will, therefore, be drawn on the basis of an efficient allocation of vessels in term of fleet segments and will fulfil different requirements:

1. exploitation of under utilised species where demand is high. This is the case of pelagic species utilised by the important albanian processing industry and which are in high demand from the local and foreign consumers;
2. exploitation of demersal stocks through the utilisation of selective gears and small coastal vessels;
3. exploitation of off shore demersal stocks through the development of a distant water trawler fleet

These requirement, of course, define the priorities of the Albanian Fisheries Management Plan.

It is a fact that some resource can be exploited only by capital intensive equipment, eg, large trawlers for shrimps and hake stocks; other fisheries are more labour intensive and require less expensive capital equipment, eg, long-liners and trammel nets. In each case, the Fisheries Management Plan aims to ensure that “optimal” fishing effort allocation is achieved and the maximum national benefit is obtained.

1.1 Fleet by area and gear

The Albanian fleet consists of 146 registered vessels with an engine power of 23,752 kW (based on the number of licences issued by the Fisheries General Directorate).

However, it must be considered that official data does not completely reflect the real size of the fishing fleet for two main reasons:

- On the one hand some boats holding licences (especially large ones made of iron or steel) are involved in other activities that are carried out either on a continuous basis, or are limited in summer, when revenues from fishing are at their lowest;
- On the other hand, there are several small vessels which do not hold licences, but are used for fishing. Many small boats are made by local shipyards, with the fishermen’s scant savings and do not apply for licences.

The geographical distribution of the fleet shows that the majority of vessels are based in Durres, with 51 vessels (35% of the total), then Shengjin and Vlore, with 36 and 31 respectively. Saranda port is the last one with 28 authorised vessels (see tab. 1.1). However, an indefinite number of small scale vessels are not included in the list.

The majority of vessels (62 vessels) hold more than one fishing authorisation, but 50 of these have over 200 KW engine power installed on board, and it is possible that they use only trawler nets and should be included in the same fishing segment with the other 38 vessels having only one

authorisation for trawl nets. Small scale registered fishing vessel account for as little as 37 vessels, while only 9 boats use purse seine gears (see tab. 1.2).

The fleet appears to be made up of vessels built in neighbouring countries and sold to Albanian ship-owners. Excluding 34 boats made in Albania, 66 vessels (45% of the entire fleet) come from Italy and 13 from Greece (see tab. 1.3). On the average, boats bought in Italy are older, and more than 50% of the whole fleet has more than 20 years. On the other hand, 34 Albanian boats have a lower average age: 9 were built in the past 10 years and 14 have less than 20 years (see tab. 1.4).

The use of wood as a building material is prevalent in the fleet (89 vessels), followed by ferrous materials (37 vessels).

An analysis of the registered fleet per engine power shows that the average size is relatively high with consequent high fuel cost. In fact, approximately 71% of the vessels have an engine power over 120 kW (see tab. 1.5). Only 14 vessels have engine power less than 60 kW and they are mainly concentrated in the small-scale fishing sector. On the other hand, trawlers have an average engine power over 180 kW.

It is a fact that the most important characteristic of the Albanian fleet relies in the vessels' high degree of obsolescence: 46 vessels have more than 40 years, 32 between 21 and 30 years, and 40 vessels fall in the range between 10 and 20 years. Breaking down the fleet by KW and age group emerges that the more powerful vessels are, on average, younger. Of the 11 vessels with engine power over 400 hp, 3 have been built within the past ten years and 3 have been operating for less than 20 years (see tab. 1.6).

As mentioned earlier, the highest number of vessels is based in the port of Durres (51 vessels), while the remainder of the fleet is spread amongst the other ports, with 36 vessels in Shengjin, 31 in Vlore and 28 in Sarande. It is also true that the port of Durres accounts for the greater share of engine power installed on board. The vessels based in this port not only represent 35% of the fleet, but also account for 43% of engine power. The difference clearly shows that vessels' sizes is higher on average. In terms of fleet size the second most important port after Durres is Shengjin, with 36 vessels and an overall engine power of 6,582 kW. The fleet is highly specialised in the trawl segment - 24 out of 36 vessels- use this fishing method. The port of Sarande, however, has a high concentration of small-scale fishing vessels - 20 out of the total 37 small-scale fishing vessels are registered here. The port of Vlore accounts for 31 vessels operating mainly with multi-purpose gears and seine, 6 vessels (see tab. 1.7).

PORT	Nr. Vessels	POWER (Kw)
Durres	51	10.168
Sarande	28	2.371
Shengjin	36	6.582
Vlore	31	4.631
TOTAL	146	23.752

Source: FD – MoAF

Fishing Gear	Power group (Kw)					All
	<= 60	61 / 120	121 / 200	201 / 300	> 300	
MULTIPURPOSE	-	2	10	31	19	62
PURSE SEINE	1	6	2	-	-	9
SMALL FISHERY	13	19	5	-	-	37
TRAWL	-	1	10	23	4	38
TOTAL	14	28	27	54	23	146

Source: FD - MoAF

Country	Hull material				All
	STEEL	WOOD	IRON	MD	
ALB	1	6	26	1	34
GR	-	12	-	1	13
IT	-	59	2	5	66
OTHER	-	1	8	-	9
MD	-	11	1	12	24
TOTAL	1	89	37	19	146

Source: FD - MoAF

MD: Missing data

Country	Age group					All
	<=10	11 / 20	21 / 30	> 30	MD	
ALB	9	14	8	-	3	34
GR	-	1	5	6	1	13
IT	1	22	15	28	-	66
OTHERI	-	1	1	7	-	9
MD	1	2	3	5	13	24
TOTAL	11	40	32	46	17	146

Source: FD – MoAF

MD: Missing data

Kw group	Port				All
	Durres	Sarande	Shengjin	Vlore	
<= 60	-	11	-	3	14
61 / 120	6	11	6	5	28
121 / 200	13	1	5	8	27
201 / 300	23	2	17	12	54
> 300	9	3	8	3	23
TOTAL	51	28	36	31	146

Source: FD - MoAF

Power group (Kw)	Age group					All
	<=10	11 / 20	21 / 30	> 30	MD	
<= 60	-	2	3	2	7	14
61 / 120	2	7	5	10	4	28
121 / 200	-	11	9	6	1	27
201 / 300	6	16	5	24	3	54
> 300	3	4	10	4	2	23
TOTAL	11	40	32	46	17	146

Source: FD – MoAF

MD: Missing data

Fishing Gear	Port	Vessels	Power
MULTIPURPOSE	Durres	31	7.385
	Sarande	6	1.362
	Shengjin	7	1.721
	Vlore	18	3.600
TOTAL		62	14.068
PURSE SEINE	Durres	1	59
	Sarande	2	118
	Vlore	6	423
TOTAL		9	600
SMALL FISHERY	Durres	6	506
	Sarande	20	891
	Shengjin	5	335
	Vlore	6	461
TOTAL		37	2.193
TRAWL	Durres	13	2.218
	Shengjin	24	4.526
	Vlore	1	147
TOTAL		38	6.892
TOTAL		146	23.752

Source: FD - MoAF

1.2 Economic and technical parameter

Estimates of the main economic parameters show that Albanian fleet's production stands at around 4,271 tons, with a value of 1,140 million leks, corresponding to 6.8 million ECUs .

The geographical distribution of the national product is highly concentrated in the port of Durres, where the fleet production is estimated to be around 1,623 tonnes, equivalent to 38% of the total Albanian landings. The ports of Shengjin and Vlore show similar levels of production, with the former accounting for 26% of the total (1,126 tonnes), and the latter accounting for 24% of the total (1,026 tonnes). The remainder of production is concentrated in the area of Saranda, producing 474 tonnes, equivalent to 11% of the total (see Table 1.8).

The composition of the catch landed by the Albanian fleet is rather mixed, as in any other Mediterranean fishing area. Among the others, depending on the gear which used on board, there are demersal species such as European hake, mullet, white prawns, shrimps, squid, octopus and cuttlefish. Angler fish, sole, Norway lobster, gilt-head sea bream are also landed. Of course, the composition of the catch depends on the season.

Until a few years ago, nearly 80% of the higher-valued fish caught was exported and domestic consumption of higher-priced items was limited. Internal consumption was based mainly on meals served in restaurants. In more recent years internal consumption shows a steep increase so that most of the produce is used for internal consumption. The price of higher valued produce stands around 350 leks/kg. The remaining part of produce, or the lower-value product, has a price around 200 leks/kg.

In 1998 the Albanian fleet fished for an average of 145 days, with an average income per boat of 7.8 million leks. There being no technical regulations to limit fishing, reasons behind the low average activity should be found in a series of causes. The main reasons are listed below:

1. structural absence of boatyards for routine and non routine maintenance and other types of vessel repairs. Vessel owners usually turn to Italian shipyards, planning routine maintenance schedules in summer period when the catch is less abundant;
2. the same applies to warehouses supplying materials such as nets, cables or engine parts. In this case, too, vessel owners usually refer to Italian suppliers, thereby increasing the length of time they are forced to stop;
3. lack of institutional fish markets and dependence on wholesale buyers needs. This implies that fishermen can be forced to stay at the quay since wholesalers cannot guarantee they will buy the catch;
4. the relatively high age of the vessels and the scarcity of investment for structural vessel maintenance, limit the vessels' efficiency and so their ability to leave port when meteorological conditions are unfavourable. Moreover, trawler fishing boat, due to obsolescence of the equipment and high cost of fuel, prefer operate in shallow water along the coastline.

An analysis of the cost structure shows that fuel costs curtail profits. Fuel cost in fact accounts for 68% of total intermediate consumption. Among other cost categories which play an important role in the whole cost structure, there is equipment cost of various types (9.7%), maintenance (5.5%) and lubricants (2.9%).

The Lek-Ecu exchange rate for 1998, was taken from the annual average of monthly rates as contained in Community statistical sources (<http://europa.eu.int/comm/dg19/inforeuro>).

In 1998 labour costs amounted to 430 million leks, meaning a cost of about 3 million leks per year per boat to be shared among the crew according to the duties carried out. Average crew size is 3 people.

The final gross cash flow from fishing, after allowing for intermediate and labour costs is estimated as high as 164 million leks. Gross cash flow earned from income is 14%. This means that from every 100 leks spent, the earning from capital investments is 14 leks, while the remainder is absorbed by intermediate consumption (48%) and labour costs (38%).

An the analysis of the cost structure by fishing gear shows deep differences between vessels. Despite the fact that fuel costs take up the greatest share of costs (71% of total costs), the percentage value ranges from 73% for trawlers with engine power of over 180 kW to 35% for small-scale fishing vessels. Though not in absolute value, the latter segment has a higher percentage of costs, as far as equipment is concerned (lines, nets, etc,) and for maintenance.

Fuel price accounts for the largest share of the cost and in Albania there is no specific rule allowing for a price lower than the market price, as in most Mediterranean countries is. This implies a lower level of competition between the Albanian and external produce. As matter of fact, another explanation for the low level of activity of Albanian vessels relies on the difficulty vessel owners meet to pay for fuel giving the market price for their produce. In many cases, depending on the cost of fuel, import price could be more convenient than internal price.

Measures aiming to decrease the fuel price should be urgently implemented in order to allow the industry to work legally.

TAB. 1.8A Capacity, activity, workforce and catch					
Port	Vessels N°	Power (kw)	Days at sea	Employment	Landings tons
Durres	51	10.168	8.051	207	1623
Sarande	28	2.371	4.110	74	474
Shengjin	36	6.582	5.668	144	1126
Vlore	31	4.631	4.612	125	1047
TOTAL	146	23.752	22.441	550	4.270

Source: FD - MoAF; IREPA

Port	Value of landings	Intermediate consumption	Added value	Crew share, wages and social insurance	Gross cash flow
Durres	479	232	247	178	69
Sarande	110	55	55	40	15
Shengjin	327	158	169	122	47
Vlore	223	101	122	89	32
TOTAL	1.140	546	594	430	164

Source: IREPA

Port	Value of landings	Intermediate consumption	Added value	Crew share, wages and social insurance	Gross cash flow
Durres	2.861	1.385	1.476	1.063	412
Sarande	658	328	330	241	89
Shengjin	1.955	944	1.011	729	282
Vlore	1.332	604	728	534	194
TOTAL	6.805	3.261	3.544	2.567	977

Source: IREPA

The rate change ECU/Lek for 1998 was calculated as monthly average of value available on: *Inforeuro Monthly Files* (<http://europa.eu.int/comm/dg19/inforeuro/files.htm>).

Port	Fuel and lube oil	Food	Maintenance	Other cost	Total
Durres	72,09%	10,48%	14,49%	2,93%	100,00%
Sarande	65,46%	9,98%	20,27%	4,28%	100,00%
Shengjin	71,84%	10,52%	14,66%	2,97%	100,00%
Vlore	68,63%	11,35%	16,62%	3,40%	100,00%
TOTAL	70,71%	10,61%	15,52%	3,17%	100,00%

Source: IREPA

1.3 Fish Stock Assessment Programme

Fish stock assessment is essential in order to achieve a sound and reliable resource management. So far, a number of surveys and campaigns have been carried out, in particular at Durres Fishery Research Institute (DFRI) and by other scientific international organisations. Unfortunately, continuity of the surveys has not been secured and it is important to guarantee adequate means to do so on a regular basis. This could be achieved by providing financial resources at DFRI and to allow a more important involvement of the ongoing international technical assistance within the ADRIAMED program.

As matter of fact, national existing funding for fish stock assessment programme within the FD are scarce and managed by DFRI that is now involved in processing data of the 1994/99 campaign. Such activities will provide valuable insight for FD staff concerning the completion of data collection activities.

At present, some available official data are those monitored during the Mediterranean international trawl survey (MEDITS) program, in order to support the management of Mediterranean fisheries, particularly for the implementation of the common fishery policy in Albanian fishing area. The need for this work has been confirmed during the last Diplomatic Conference on fishery management in the Mediterranean (Venice, 1996) and during the Conference on Adriatic Sea held in Ancona (may 2000).

Within the MEDITS program it was used a common methodology for trawl surveys in all Countries involved, including Albanian stocks. The campaign were investigating the state of demersal stocks until 800 depth. It consisted in trawling for 30 minutes until a depth of 200 m and for one hour for the depth more than 200 m. Every km² the number of specimen and the weight was measured for each species. Data are presented in the table and show indexes of abundance.

Table 1.9 - Index of abundance by species along Albanian coast						
Year	1996		1997		1998	
Species	Kg/km ²	N/Km ²	Kg/km ²	N/Km ²	Kg/km ²	N/Km ²
<i>Eutrigla gurnardus</i>	0.05	7	0.01	1		
<i>Helicolenus dactylopterus</i>	0.71	42	0.48	76	0.24	20
<i>Lophius budegassa</i>	7.11	23	7.41	16	6.29	11
<i>Lophius piscatorius</i>	5.43		0.23		1.58	
<i>Merluccius merluccius</i>	40.02	601	34.71	615	16.69	188
<i>Micromesistius poutassou</i>	2.81	94	0.7	7	0.82	6
<i>Mullus barbatus</i>	7.4	220	6.73	193	8.59	266
<i>Mullus surmuletus</i>			0.13	1		
<i>Pagellus erythrinus</i>	2.42		2.16		2.34	
<i>Phycis blennoides</i>	2.33	118	0.78	19	1.24	92
<i>Raja clavata</i>			0.02	1	2.28	2
<i>Solea vulgaris</i>	1.09		0.92		1	
<i>Spicara flexuosa</i>			0.84	23	11.14	728
<i>Trachurus mediterraneus</i>	8.52	154	0.7	13	8.52	154
<i>Trachurus trachurus</i>	49.39	6673	2.2	124	7.76	1535
<i>Trisopterus minutus</i>	3.47	349	3.79	351	303	225
<i>Zeus faber</i>	4.29	8	2.4	3	5.07	8
<i>Aristaeomorpha foliacea</i>	2.2	87	3.19	100	1.78	72
<i>Nephrops norvegicus</i>	2.03		0.65		1.29	
<i>Parapenaeus longirostris</i>	13.46	2336	4.77	789	10.76	1348
<i>Eledone cirrhosa</i>	16.46	67	9.15	51	7.39	50
<i>Eledone moschata</i>			1.38	13	4.73	26
<i>Illex coindetii</i>	1.4		1.34		2.46	
<i>Loligo vulgaris</i>	4.37	240	5.52	267	3.55	622
<i>Octopus vulgaris</i>	2.92		1.5		1.86	

Source: FD's estimate on MEDITS data

Some important differences have been noted in bio-mass indexes during the last two years. Thus, during 1998 the abundance for *Merluccius merluccius*, *Eledone cirrhosa*, *Spicara flexuosa* and *Helicolenus dactylopterus* was reduced. Though, during 1997, it was registered a reduction of *Parapenaeus longirostris*, *Mullus barbatus* and *Trachurus* gender, they have been increased during 1998. The reduction of the above-mentioned species has begun since 1996. In this case it is evident the need for a specific management action in order to define the influencing factors and guarantee the correct ratio between fishing effort and stock abundance.

1.3.1 Analysis of fish stocks

In the following some of the more important outcomes are reported:

CITH MAC Citharus macrolepidotus

This species was caught on continental shelf with abundance indexes ranged from 0.42 Kg/Km² to 1.22 Kg/km² (stratum 50-100 m).

EUTR GUR Eutrigla gurnardus

Not fished at all.

HELI DAC Heliconelus dactylopterus

Heli dac was fished at depths greater than 100 m; abundance indexes are higher between 200 m and 500 m depth. The highest bio-mass and abundance values (0.81 Kg/Km², 79/Km²) was observed in 200-500 m.

LEPM BOS Lepidorhombus boscii

This species was mostly caught beyond 200 m of depth with low yield and density; the highest bio-mass and abundance values (2.03 Kg/Km², 47/Km²) was observed in 200-500 m stratum.

LOPH BUD Lophius budegassa

Loph bud was found across the whole depth range investigated; the highest abundance index (21.87 Kg/Km²) was observed between 50 and 100 m.

LOPH PIS Lophius piscatorius

The species was found only in 500-800 m depth stratum (7.24 Kg/Km²).

MERL MER Merluccius merluccius

The species was distributed in the whole area, mainly between 50 and 200 m. In this depth zone density ranged from 285 specimens /Km² to 384 specimens /Km². The highest abundance of 29.85 Kg/Km² was observed in depth stratum 50-100 m.

MICM POU Micromesistius poutassou

The species was found with low yield from 200 m to 800 m depth. The highest density (16 specimens /Km²) was observed in 200-500 m stratum.

MULL BAR Mullus barbatus

The species was caught almost exclusively on the continental shelf (depth < 200 m). The highest abundance in weight (17.51 Kg/Km²) was found in the depth stratum 100-200 m, while the highest density in number (545/Km²) was found in the depth stratum 50-100 m.

Most of specimens had a length between 10 cm and 20 cm.

MULL SUR Mullus surmuletus

The species was caught on the continental shelf (depth < 200 m) with low yield.

PAGE ACA Pagellus acarne

This species was found within 50-200 m strata, with very low abundance.

PAGE BOG Pagellus bogaraveo

Few specimens were fished in the deeper zone beyond 200 m.

PAGE ERY Pagellus erythrinus

The species was found only in the continental shelf (mainly between 10-100 m); the highest abundance index was 10.44 Kg/Km² (10-50 m stratum).

PHYI BLE Phycis blennoides

It was generally found beyond 100 m of depth exhibiting the highest abundance index (3.17 Kg/Km²) between 500 and 800 m. Most of the specimens fished were smaller than 20 cm.

RAJA CLA Raja clavata

The species was mainly caught on shelf bottoms; the highest abundance (12.13 Kg/Km²) was found in 10-50 m depth stratum.

SOLE VUL Solea Vulgaris

The species was found only in the continental shelf; the highest abundance index was 3.94 Kg/Km² (10-50 m stratum).

TRAC MED Trachurus mediterraneus

The species was fished on the continental shelf (depth <200 m), mainly between 10 m and 100 m, with yields ranging from 2.01 and 2.93 Kg/Km².

TRAC TRA Trachurus trachurus

The species was caught from 10 m to 500 m depth. The highest abundance indexes were obtained in 50-100 m stratum with value of 20.28 Kg/Km². Juveniles were dominant in the catches.

TRIS CAP Trisopterus minutus capelanus

The species was caught between 10-200 m depth; the highest yield (5.08 Kg/Km²) was found in 50-100 m depth stratum.

ZEUS FAB Zeus faber

The species was found between 50 m and 200 m; the highest abundance value was 11.99 Kg/Km² (100-200m).

ARIT ANT Aristeus antennatus

The species was only fished in the deepest water of the southern area (Vlora-Saranda). The yields were very low.

ARIS FOL Aristaomorpha foliacea

It was generally caught beyond 500 m of depth. Its yields in weight and numbers were 8.12 Kg/Km² and 326 specimens/Km² respectively. The sizes of specimens mainly ranged from 25 mm to 65 mm.

NEPR NOR Nephros norvegicus

The species was generally caught with valuable yields at depth greater than 200 m. The highest yield (3.91 Kg/Km²) was observed between 200 and 500 m. Most carapace lengths ranged from 25 to 60 mm.

PAPE LON Parapeneus longirostris

The species was abundantly caught, mainly at depths between 200 and 500 m; the highest yields were 27.12 Kg/Km² and 3184 specimens/Km² in the zone of 200-500 m. The sizes of specimens mainly ranged from 10 mm to 35 mm.

ELED CIR Eledone cirrhosa

It was generally fished in depths greater than 50 m and shallower than 500 m. The highest yield (16.34 Kg/Km²) was observed between 100 and 200 m. Most mantle lengths ranged from 3 to 12 cm.

ELED MOS Eledone moschata

It was generally fished on continental shelf, between 10 m and 100 m. The highest yield (29.04 Kg/Km²) was observed between 10 and 50 m.

ILLE COI Illex coindetii

The species was caught with higher density between 50 m and 200 m depth. Its highest yield was 29.04 Kg/Km².

LOLI VUL Loligo vulgaris

It was fished with remarkable yields within 100 m depth. The highest abundance index (8.34 Kg/Km²) was found in the second stratum (50-100 m). The specimens mantle lengths are generally smaller than 10 cm (juveniles), but some specimens with size larger than 15 cm were found between 200 and 500 m depths.

OCTO VUL Octopus Vulgaris

The species was found as far as 100 m. The highest abundance index was 25.79 Kg/Km² (10-50 m stratum).

1.3.2 Analysis the most important species of each stratum (1998 survey)

1 - Depth stratum A (10-50 m)

In this first stratum the five most important species were *Eledone moschata*, *Octopus vulgaris*, *Mullus barbatus*, *Raja clavata*, *Merluccius merluccius*.

Eledone moschata was found with indexes of 29.04 Kg/Km² and 166 specimens/Km².

The length frequency distribution ranged from 4 cm to 13 cm; two modal peaks were found at 5-6 cm and 10-11 cm (mantel length).

Octopus vulgaris was caught with a mean abundance value of 25.79 Kg/Km². The mean density was 22 specimens/Km² and the length frequency distribution ranged from 9 cm to 16 cm.

Mullus barbatus was found with indexes of 13.09 Kg/Km² and 484 specimens/Km². The length frequency distribution ranged from 10 cm to 18 cm (higher frequencies between 12 cm and 14 cm).

Raja clavata catch indexes were 12.13 Kg/Km² and 4 specimens/Km² (big individuals).

The mean yields of *Merluccius merluccius* were 11.34 Kg/Km² and 131 specimens/Km². The length frequency distribution ranged from 7 cm to 31 cm (higher frequencies between 21 cm and 27 cm).

2 - Depth stratum B (50-100 m)

The five most important species between 50 and 100 m in the region were *Merluccius merluccius*, *Lophius budegassa*, *Trachurus trachurus*, *Mullus barbatus*, *Eledone moschata*.

Merluccius merluccius mean abundance index was 29.85 Kg/Km², while mean density was 384 specimens/Km². The length frequency distribution ranged from 8 cm to 38 cm (higher frequencies between 20 cm and 23 cm).

Lophius budegassa was found with yields of 21.87 Kg/Km² and 33 specimens/Km². The length frequency distribution (irregular) ranged from 12 cm to 56 cm.

Trachurus trachurus mean yields were 20.28 Kg/Km² and 4257 specimens/Km². The length frequency distribution ranged from 5 cm to 13 cm (juveniles).

Mullus barbatus was found with indexes of 13.14 Kg/Km² and 545 specimens/Km². The length frequency distribution ranged from 10 cm to 22 cm, with modal peak at 11-13 cm.

Eledone moschata was found with yields of 10.47 Kg/Km² and 53 specimens/Km². The length frequency distribution ranged from 6 cm to 13 cm, with modal peak at 10-12 cm (mantle length).

3 - Depth stratum C (100-200 m)

The five most important species for this depth stratum were *Merluccius merluccius*, *Mullus barbatus*, *Eledone cirrhosa*, *Zeus faber*, *Trachurus trachurus*.

Merluccius merluccius mean abundance index was 18.88 Kg/Km², while mean density was 285 specimens/Km². The length frequency distribution ranged from 6 cm to 36 cm; two modal peaks were found around 10-11 cm (recruitment) and 23-26 cm.

The species *Mullus barbatus* was found with indexes of 17.51 Kg/Km² and 379 specimens/Km². The length frequency distribution ranged from 10 cm to 24 cm and modal peak was around 13-15 cm.

Eledone cirrhosa was found with yields of 16.34 Kg/Km² and 126 specimens/Km². The length frequency distribution ranged from 3 cm to 11 cm; two modal peaks were found around 3-4 cm and 9-10 cm respectively (mantle length).

Zeus faber was found with indexes of 11.99 Kg/Km² and 13 specimens/Km². The length frequency distribution (irregular) ranged from 28 cm to 46 cm.

The species *Trachurus trachurus* was found with indexes of 8.95 Kg/Km² and 1655 specimens/Km². The length frequency distribution ranged from 5 cm to 38 cm, with modal peak at 8-9 cm (recruitment).

4 - Depth stratum D (200-500 m)

The five most important species for this depth range were *Parapenaeus longirostris*, *Eledone cirrhosa*, *Merluccius merluccius*, *Loligo vulgaris*, *Nephrops norvegicus*.

The species *Parapenaeus longirostris* was found with indexes of 27.12 Kg/Km² and 3184 specimens/Km². The length frequency distribution (carapace length) ranged from 10 mm to 39 mm (mostly between 21 mm and 23 mm).

Eledone cirrhosa was found with yields of 13.78 Kg/Km² and 82 specimens/Km². The length frequency distribution ranged from 3 cm to 12 cm; modal peak was found around 10-11 cm (mantle length).

Merluccius merluccius mean abundance index was 10.25 Kg/Km², while mean density was 40 specimens/Km². The length frequency distribution (irregular) ranged from 12 cm to 70 cm.

The species *Loligo vulgaris* was found with indexes of 5.32 Kg/Km² and 40 specimens/Km². The length frequency distribution ranged from 12 cm to 21 cm.

Nephrops norvegicus was found with indexes of 3.91 Kg/Km² and 111 specimens/Km². The length frequency distribution (carapace length) ranged from 22 mm to 56 mm (mostly between 30 mm and 45 mm).

5 - Depth stratum E (500-800 m)

In this bathymetric stratum the five most important species for the region were *Parapenaeus longirostris*, *Aristaeomorpha foliacea*, *Lophius piscatorius*, *Merluccius merluccius*, *Phycis blennoides*.

The species *Parapenaeus longirostris* was found with indexes of 10.77 Kg/Km² and 890 specimens/Km². The length frequency distribution (carapace length) ranged from 21 mm to 40 mm (mostly between 26 mm and 29 mm).

Aristaeomorpha foliacea was found with the yields of 8.12 Kg/Km² and 326 specimens/Km².

The length frequency distribution ranged from 20 mm to 68 mm (mainly between 43 mm and 48 mm, carapace length).

The species *Lophius piscatorius* was found with indexes of 7.24 Kg/Km² and 1 specimens/Km². *Merluccius merluccius* mean abundance index was 6.62 Kg/Km², while mean density was 10 specimens/Km². The length frequency distribution (irregular) ranged from 20 cm to 66 cm.

Phycis blennoides mean abundance index was 3.17 Kg/Km², while mean density was 217 specimens/Km². The length frequency distribution ranged from 8 cm to 39 cm, with an apparent peak at 11-12 cm (recruitment).

1.4 Policy options of Marine Fisheries Action plan

In order to define the objectives that the Fisheries Management Plan should pursue, an analysis on productive structures in the Albanian fishing industry has been drawn and a SWOT analysis scheme has been realised as to make the logic of intervention more transparent.

SWOT ANALYSIS OF THE ALBANIAN FISHING INDUSTRY

Strengths	Weaknesses
<p>The limited size of the fishing fleet helps programming for the sector, and action is favoured as for the application stage.</p> <p>The limited number of ports (4) avoids problems implicit in a widespread distribution of production and supply, and favours the process of a functional concentration which would safeguard prices.</p> <p>The relatively recent development of entrepreneurial businesses is a factor which will favour policy programming for the industry development, compatible with the principles of sustainable fishing, and adequate to the resources availability.</p>	<p>Absence of infrastructure framework to support fishing activities both at the top and the bottom: inadequate ports and mooring points; no fish markets; no shipyards and plant for maintenance; very few to no sales outlets for various materials (nets, lines and other equipment).</p> <p>Absence or underdevelopment of commercial structures able to supply foreign markets.</p> <p>No access to credit. In the current state of affairs there are no bank credit facilities for fishery-related firms.</p> <p>High tax regime, particularly for fuel, which remains unsubsidised.</p> <p>Obsolete fleet both in terms of structure and technology with scarce-to-non-existent level of investment for modernisation. The majority of the fleet is not suitable for fishing out of three / five miles, and so exploitation of stock along the coastal area. This kills off a vast quantity of juveniles, meaning that the majority of the catch is undersized and leads to over-fishing of the resource.</p> <p>Excessive quantity of illegal fishing, especially using explosives.</p>
Opportunities	Risks
<p>Growth in domestic consumption levels and opening out to international, and particularly Community, markets is the greatest opportunity for the sector.</p> <p>The current state of the fishing implies that many improvements can be made with low levels of financial investments.</p>	<p>Concentration of fishing effort in the hands of a few traders.</p> <p>Participation of foreign capital in the exploitation of the resources with little interest for their sustainability.</p> <p>Risks of increasing resource over-exploitation both in terms of an increase in coastal fishing areas and use of fishing techniques dangerous to the environment.</p> <p>Risk of a disorderly and irrational growth in productive structures.</p>

1.4.1 Marine Demersal Fishes

These resources are presently exploited by trawlers and smaller vessels using long-lines and gill nets. In general the design of the vessels is old and their condition is poor. Fish caught by larger vessels are boxed and iced at sea. Few vessels are equipped with modern aides to fishing such as echo sounders and global position recorders.

Fishing trawlers use nets with cod ends of a mesh size of 14-18mm, other countries of the region use 24mm, size recommended by the General Fisheries Council of the Mediterranean is 40mm.

1.4.1.1 Marketing of the Catch

The landing is sold through wholesalers who distribute the produce on domestic and foreign markets, since there is no public wholesale fish auction able to concentrate the production. Best prices are received for whole fish and the most important markets are Greece and Italy. Spain is important for hake. Prices are increasing and the market is today stable around international values. Because of the high value of Albania's demersal fish resources, the FD anticipates that the main target will be the achievement of maximum national benefits. This will be obtained through a sound resource management policy granting for the sustainability of stocks and the realisation of new fish markets together with the development of outlets having ice machines, plastic boxes, refrigerated transports, available to fishermen co-operatives and their associations.

1.4.1.2 Future Management priorities

The main problem affecting the industry is the presence of obsolete vessels both in terms of structure and technology, with scarce-to-non existent levels of investment for modernisation. The renewal of the fleet is the first priority and it is combined with specific sub-objectives: training and financial credit.

Training is an important issue since new electronic equipment and gears have not been installed on board during last years and require professional formation.

Short and long term credit programmes for the fishing industry is a major priority since professional do not have easy access to the banking sector. Either the cost of money and high interest rates, or the guarantees required to be eligible for loans call for a specific action allowing an easier access to financial resources. In this respect, also considering fishermen willingness to invest in their own activity, it is mandatory to activate a programme in this field. In some cases, it would be sufficient to establish a micro credit programme, while for more important investments, a large scale programme is required.

At last but not least, fishery sector is incurring in declining contingency as a result of the increase of the price of fuel that makes up about 70% of the total production cost. At the same time, it must be stressed that the fuel price is cheaper in Italy and Greece, which are competing on the same stocks where Albanian fishermen traditionally work. It is evident the discrimination against Albanian fishermen who show higher prices than their foreign competitors. As matter of fact in Italy fuel price range from 0.23 to 0.26 euro per liter, where the price on the market is 0.85 lira (115.5 leke).

Furthermore, it has to be considered that, caused by the obsolescence of the fleet, Albanian vessels are more fuel consumers than other modern boats equipped with fuel saving engines.

In order to make clear the situation emerging from a decrease in Albanian fuel price, the FD has produced a study aiming at showing that the cost of the reduction is by large offset by benefits accruing the Albanian collectivity.

This study has taken into consideration the average fishing days of the vessels based on the power of their engines.

As it can be seen, the annual fuel consumption for the fishing fleet is about 24,828,960 liters which correspond, at actual cost, to 1,489,737,600 leks (calculating the price of fuel at 60 leks). If the fuel has to be sold at the price of the factory transport, about 40 lek per liter, the value would be 993,158,400 lek that means a difference of 496,579,200 leks.

The proposed price 40 lek/liter would activate the fishing fleet bringing an increase in the production. The actual production from 1,885 ton/year would increase to 5,000 ton/year. The export would increase from 6 million US\$ to 18 million US\$ per year.

Power of the engine	N. of vessels	Total HP	Consumption in HP in ml	Total consumption per Hp	Hours of fishing per year	Total liters
< 80	32	2560	200	512000	2100	1075200
81-150	34	4112	200	822400	2400	1973760
151-299	57	14250	200	2850000	3300	9405000
300-408	45	15750	200	3150000	3300	10395000
Over 400	6	3000	200	600000	3300	1980000
Total						24828960

1.4.1.3 FD Resource Management Actions

Resource and fisheries management requires an updated information system in order to let this resource produce the maximum benefit to the Country. In this respect, it will be needed to get accurate data on fishing effort, catch and information on costs and earnings of fishing (eg, gross payments for salaries, fuel and lubricants, repairs, financial charges, port fees, etc.). This can be done through sample survey monitoring not more than 15-20% of the fleet. Relevant biological information will be needed on spawning areas and especially nursery areas to protect juvenile fish.

From a resource management rules it has to be considered that the optimal mesh sizes must be at least equal to that recommended by regional fisheries management organisations (ie, 40mm) and the benefits of such a measure explained to the fishermen and then effectively enforced.

It is recognised that at present FD institutional capacity to undertake effective management of Albania's demersal resources needs to be strengthened and assistance can be provided from such organisations as the European Union and the Food and Agriculture Organisation. At present, a functional active data collection programmes, either on fishing effort, catch and technical economic parameters, represents a priority to be undertaken by the FD, as soon as financial resources will be available.

The Durres Fisheries Research Institute has the capacity to undertake yield-per-recruit analysis to determine optimal rates of fishing mortality, but some further assistance will be required to achieve this goal. In this respect, a regional trawl survey programme (ADRIAMED), funded through the Italian Ministry of Agriculture and Forestry Policy and managed by FAO, will provide fish samples and it is supposed to provide the basis for an annual index of abundance for commercial fisheries. It

will not, however, replace the need for port sample information regarding collection of technical economic parameters.

1.4.2 Small Pelagic Fishes

In the past, Albanian vessels used to land these species (sardines and to a lesser extent anchovy) using small purse seine vessels. At the moment, this fishery is largely under-exploited and an action to modernise the fleet is a priority. Depending on the utilisation of the catch, either for fresh consumption or for canneries, the fishing gears to be introduced has to be decided. Purse seine will allow a better quality if fresh consumption is the target, while, as in other fishing areas in the Mediterranean, pair trawling has proven to be a more cost-effective in case of production to be sold for industrial purpose. It is also true that the vessel dimension is important: purse seine can be installed independently of the dimension, while pair trawling require 60/80 GT at least to be economically convenient.

1.4.2.1 Marketing of the Catch

Prior to the events of 1991, most of small pelagic species were canned and sold to the un-competitive markets of Eastern Europe. These markets no longer exist and today the vessels are not in condition to fish any more.

Depending on the cheaper cost of labour, in recent years a number of important laboratories for the small pelagic species have been installed in Albanian territory, in particular in Shengjin area, but they only work on imported material.

1.4.2.2 Future Management Priorities

It is self evident that the rehabilitation of the small pelagic species fleet would be an important opportunity, since the catch already have a market demanding increasing quantities to process. Further development of these factories will obviously depend on the existence of a local production and it follows that priority should be given to the renewal and construction of purse seine and pair trawling vessels.

It must also be admitted that little of this resource is actually consumed on domestic markets, primarily because does not reach consumers. In many other Mediterranean countries, strong consumer demand exists for these species, both in fresh and canned presentation. In this respect, FD priorities will be concentrated to allow a more intensive exploitation of this species in order to let domestic consumption increase. It is also recognised that, above all, initiatives must come from the private sector, while public policy options will be limited to provide the maximum incentive to the fleet rehabilitation.

1.4.2.3 Resource FD Management Actions

Once the fleet will be rehabilitated, resource management of small pelagic species should be oriented to ensure that minimum levels of stock bio-mass is maintained and the - MBAL - the minimum biologically acceptable level is guaranteed. The FD should also set up a continuous monitoring system in order to get accurate data on catch rates, fishing effort, fish size composition and the fishing areas. Co-operation of the industry will be required when the system will be put in place.

The relatively weak association between the amount of fishing effort and the resulting 'sustainable' catch means that fishing management had to be performed through specific programs, in particular, the link between market demand and stock availability has to be taken into account. Rules concerning day at sea per vessel is one of the more efficient way to do so.

1.4.3 Shell-fisheries

The commercial fishery for bivalve molluscs, of which clam is the main species, was closed by the Ministry of Agriculture and Fisheries in June 1991 because of severe depletion of the resources and closure of the export markets as the product failed to satisfy European Union sanitary requirements. In the past the fishery had been exploited by hydraulic dredges by a fleet consisting of five boat. At the moment, this gear has been forbidden given the excessive exploitation and it is believed that also in future the limit will be maintained. Yet, production can be developed through the utilisation of more traditional gears and in inshore fishing areas as soon as the EU sanitary rules will matched.

1.4.3.1 Marketing of the Catch

Excellent market conditions exist for this product in Italy and other European Countries and local producers are in condition to increase steeply the actual poor production. Given these circumstances, FD intervention should be limited to securing the harvest is maintained at the highest level of quality, so that clam dimension will exceed 2,4 cm, and meet export market health requirements.

Should market prices vary significantly during different seasons, the FD would consider, in consultation with the industry, closing the fishery during periods of low market price.

1.4.3.2 Future Management Priorities

EU hygiene requirements are key factors in the management of the shell fisheries and their monitoring and maintenance must be considered a high priority within the Fisheries Management Plan. Once EU hygiene requirements have been met FD is already aware the resource will be subject to strong fishing pressure and a high risk of over-exploitation. Therefore it is important that effective regulatory controls must be in place to ensure the conservation of this resource.

To ensure that the resource is exploited rationally, the size of the catch, length composition and areas of fishing should be monitored continuously and this could be done within the monitoring system previously reported. The utilisation of these information can guarantee a satisfactory management, in particular, considering that this species is stable and does not move from its own territory. Several management tools exist, among others time limits and closure of the area for some time, which have been experienced elsewhere and could be introduced also in Albania.

1.4.3.3 FD Management Actions

The strong export demand for this species and willingness of foreign buyers to pay good prices, together with an unusual low internal demand, the primary management objective for this fishery will be the guarantee of employment level and the earnings of foreign currency. Given this targets its necessary to have a close co-operation with professionals, introducing a set of rules which would allow the maximum revenue from the selling of their produce. This will involve dimension and quantity of clams to be caught.

As in other cases, it is the professionals themselves which should ultimately be able to monitor their own fishery in relation to the allocation of specific quotas.

The major action to ensure conservation of the resource should be a comprehensive port sampling programme. This programme would monitor the size distribution of the harvests from the different grounds to ensure over-fishing does not occur.

Given the existing strong market demand and the potential for effective management of this fishery, already discussed in this section, the fishery could be highly profitable and there could be considerable pressure by new entrants to be licensed. The FD will develop appropriate policies (eg, increases in licence fees) to ensure the benefits emerging from the clam fishery do not get dissipated through an inappropriate level of fishing effort.

Management options available to the FD are:

- i. licence limitation on the number and engine power of vessels permitted in the fishery,
- ii. maintenance of the actual limitation on the introduction of hydraulic dredges;
- iii. introduction of quota allocation to each licensed professional.

1.4.4 Statistical services

Fishing industry management is largely based on availability of accurate data on each sector participating in the industry. Planning is an other important activity for which the FD is responsible and also requires basic as well as detailed information which could only be achieved through a continuous monitoring system. In particular, biological and economic parameters are needed for resource management, production and cost information are required in case of aquaculture, lagoon and processing industry, together with all relevant technical data.

At the moment, a valuable Geographical Information System (GIS) has been developed within the FD containing all relevant basic information concerning the structure of the Albanian fishing industry, but, as it is now, this tool has a static feature, which needs to be further developed by implementing a wider set of data and its continuous updating.

Recently, within the Technical Assistance Program to the FD and together with the Inspectors Staff of the FD itself, promoted within the EU PHARE Program, it has been carried out a pilot experience as to the implementation of an: *Economic Observatory* monitoring and estimating cost and earnings data for the whole Albanian fisheries. This experience should be continued over time in order to get a complete time series data to be used for management and planning purposes.

The combination of the two different tools, GIS and Economic Observatory, represent a valuable basis in order to set up a statistic bureau within the FD able to follow the fishing industry's activity and provide data needed to support programming and intervention measures able to ensure rational use of marine resources, compatible with the principles of responsible fishing as indicated by FAO Code of Conduct. Moreover, these tools represent a valuable information system to support public administration allocating financial resource through the industry different sectors.

In particular, the *Economic Observatory's* programme must be developed along four main lines which can be identified with the same number of groups of technical and economic variables:

- 1 *catches and earnings* are the quantities caught, the corresponding prices and earnings for each species or homogenous species groups;

- 2 *costs* include all the costs incurred (i.e. fuel and lubricants, ice, boxes, sale, nets, food, maintenance, national insurance contributions, vessel and buildings insurance, and others);
- 3 *accounts* include all the main economic indicators, added value, gross profit, capital invested, interest, tax write-offs and net profit;
- 4 *fishing effort* include all data referring to fishing fleet activity and capacity introduced in different fishing areas. Following the EU definitions, activity is calculated using the number of fishing days, while capacity is Gross Tonnage and motor power.

In addition to the above, specific indicators can be calculated, the most widely used of which for the fishing sector are the following:

- i. earnings against capital invested (ROI),
- ii. earnings against sales (ROS),
- iii. rotation of capital invested (TRC),
- iv. return on equity (ROE).

It should be also recognised that, because of the complexity of the system, the FD will need to allocate adequate human and financial resources to the information services.

1.4.4.1 Fisheries Statistical Services

A major goal of the statistics service, within the FD, is to produce regular reports providing the basis for resource management, planning, economic policy and dissemination of information to other government departments, industry, non-governmental institutions such as universities or others national and international agencies and the public. This is best done by preparing regular reports that will be distributed to a limited number of agencies, eg, the Institute of Fisheries Research in Durres and government departments for economic planning. While annual reports might be given a wider circulation, eg, to national and university libraries, other type of reporting activity should have a more limited distribution.

Annual report will contain the following data:

- number of fishing licence and fleet structure,
- national production by weight, value and species for each port,
- fleet size and characteristics
- catch by species and area
- catch by gear
- landings by port
- value of landings by species and area
- costs and earnings and species.

2. INSHORE AND COASTAL LAGOON FISHERIES

About 150 small boats owned by private groups are currently applying traditional fishing with gillnets, hooks, and other selective gears along the coast and in coastal lagoons. In the coastal lagoons there are gillnets and fish barriers. This fixed fishing gear based on the principle of V shaped traps is made of plastic pipe in the main channel. Part of these boats are situated in the coastal lagoons, harbours and other sites along the coast line. About 100 boats are equipped with engine.

The most important coastal lagoons have a total surface area of about 10 thousand ha. and represent an important potential production once they will be properly managed. Employment in this sector is another valuable aspect of the industry which requires particular attention as from a social and economic point of view.

Karavasta Lagoon is one of the richest ecosystems in term of bio-diversity. It lies approximately halfway along Albania's western coastline. The surface area of the lagoon covers 3900ha and it is connected with the sea via three channels. The average water depth is 0.7-0.8m, the salinity is 15mg/l in winter rising to 58mg/l in summer with an annual average of 25mg/l. In recent years production ranged between 100-300kg/ha per year, and reached as much as 50-60metric tons of eels annually in the best years. Fishing along the coast and in the lagoon is undertaken by a co-operative of 90 people. Fishing is carried out by using fish weir in the channels and gill-nets, hooks and other selective gear. Eel traps are also largely used.

Butrinti Lagoon is situated in the southern coast line of the Country, in the Ionian sea. It has an extension of 1630ha and is connected with the sea via one channel. On the south-west part of the lagoon there is another channel that connect the lagoon with Rreza lake. The salinity of the lagoon varies 13-26‰ and the annual temperature is 12-27°C. In the lagoon the fishery sector is under the administration of a co-operative of fishermen who are responsible also for the fish weir. Fish production in the lagoon is estimated to be 96mt per year. Main fish species in the lagoon are Grey mullet, Seabass, Seabream. Butrinti lagoon is well known for mussel aquaculture. Before 1990's the mussel productivity was 2000-3000 ton per year. After the dystrophic crisis in 1992 the activity was abandoned. At the moment there are 7 small farms cultivating mussel. The annual productivity is estimated 150 tons per year.

Narta Lagoon is situated in the north western part of Vlora district. It has an extension of 2670ha with a maximum depth of 0.9m with an average of 0.7m. The salinity has very high values estimated 78mg/l in summer and 36mg/l in winter. The lagoon is connected with the sea via two channels. A third channel that used to connect the lagoon with the sea, is now disappeared and it is not considered as a channel any more. Fishery sector in the lagoon is undertaken by 11 private entities. These are divided: two groups in the fish weirs with 8 and 6 fishermen respectively and nine groups in the lagoon with three fishermen each. Beside fish weir, in the lagoon are used different kinds of nets, lines with hook for eels and traps for mullet. In the last years fish production in the lagoon has varied between 130-140 tons per year.

Orikumi Lagoon is located in the south western part of Vlora district. It has a surface of 150ha. The maximum depth is 3.5m with an average of 2.5m. The salinity varies from 22mg/l in winter to 35mg/l in summer. The lagoon is connected with the sea via one channel. Fishing activity in the lagoon is carried out by a co-operative with 12 fishermen. Beside fish weir they use nets and eel traps in the lagoon. The annual productivity of the lagoon varied between 8-10 tons per year.

Patok Lagoon is part of the western lowland of the Mediterranean area of Albania along the Adriatic sea, west of Lezha town. It is situated between the 2 mouths of Droj and Mat rivers. The lagoon is divided in two parts: the big and the small one. The total area of the lagoon is 250ha. It is connected with the sea via one channel. The average depth is 1m. The salinity reaches the values 30mg/l. There are about 36 fishermen that fish in the lagoon. They use fish weir in the channel and nets in the lagoon. The annual production for the last years is 30 tons.

Kune-Vain Lagoon is situated in the western part of Lezha town and north of the mouth of Drini river. The area of the lagoon is 250ha. The maximum depth is 5m, and the average is 1.5m. The salinity varies 20 – 38mg/l. There are two channels connecting the lagoon with the sea. Actually there are 25 fishermen fishing in the lagoon. The annual productivity of the lagoon is estimated 45 tons.

Vilun Lagoon is situated in the north of Albania, 7km in the south of Buna river mouth and 10km north-west of Shengjini port. The surface of the lagoon is 250ha. The maximum depth is 5m and the average is 1m. The salinity reaches the value of 28mg/l. Fishing in the lagoon is carried out by 20 fishermen. They use nets of different diameters and eel traps. The average annual production is 16 tons.

2.1 Future management priorities

The main problem faced by FD managing Albania's coastal lagoons concerns the prevention of over-fishing of species which use the lagoons as their primary habitat.

Because coastal lagoons are also close to towns and cities and demand for fish product is improving, there is a natural strong pressure to increase the level of exploitation in these sites. The FD will be called to protect life in lagoons securing the sustainability of production over time.

Moreover, there are two issues concerned with protection of lagoons and their biological environment. First, the protection of the ecosystems and second, the improvement of their hydrologic conditions. Attempts made in order to re-establish water connections between lagoon and sea as in Karavasta and Narta have been efficient.

An urgent need exists to determine existing levels of fishing activities and levels of fishing mortality. In this case scientific studies are needed in order to allow new and efficient investment in lagoon areas. A Phare program could be implemented in order to satisfy such requirements. Once this has been done will be possible into what are the optimal management practices.

At present, the DFRI Institute of Fisheries at Durres is supporting FD's lagoons management activity. It is recognised that much scope exists to expand lagoon management and production and this is one of the priorities the FD has set.

2.2 FD Management Actions

The primary objective in management of Albania's coastal lagoons is the protection of their environments so as to maximise biological productivity. Policy options consist in activating programmes directed to the prevention of land pollution, e.g., from sewerage, agriculture or other human activities, and allowing harvesting activities in a way that will be compatible with resource sustainability. Actions for controlling fishing effort will include:

1. Controlling the number of licences for allowing fishermen to exploit lagoon,
3. Setting, and enforcing restrictions according to the size and nature of each fishing gear,
4. Establishing fishing seasons,
5. Establishing areas within the lagoon where fishing is prohibited or otherwise restricted.

3. FISHERIES IN INLAND WATERS

Albania's freshwater fisheries consist of a wide sector which in some cases has been managed by assigning property rights, and in some other, resources are still in a situation of common access, i.e., Albania's major lakes and large public reservoirs. The Fisheries in Inland Water Action Plan is oriented to give priority to common property resources management: lake and artificial basin fisheries. Albania has a great number of natural lakes, irrigation basins, etc, (only the collecting points of water for irrigation are about 670 with a surface of about 12 000 ha), all of them are actually under exploited. The main problems which these fisheries suffer can be summarised in: loss of traditional markets, lack of management expertise and working capital. The kind of problems indicate that re-establishing these fisheries in the form they achieved in years before 1991 is unlikely and they may never recover their former importance. Anyway, fisheries in inland water could play an important role in favouring the development of domestic internal markets for fresh product, giving economic opportunities to poor rural areas. In such a perspective FD intends to implement a programme for re-stocking of inland waters and considers Micro-credit Schemes as a useful tool for economic development of freshwater fisheries and local rural areas. Micro-credit has proved itself to be an effective tool for poverty alleviation by creating opportunities to get access to financial resources and services: donors, business houses, private individuals and governments should provide funds in order to set up a domestic micro-credit institution. The scheme would also prove to be useful in other sectors of the fishing industry as small aquaculture farming.

3.1 Lakes Fisheries

The three major lakes in Albania are all shared with other Countries, and all of them have tectonic origin: Ohrid Lake, Shkodra Lake and Prespa Lake. It must be recognised that Albanian government has taken in consideration the preservation of the existing genetic diversity by re-stocking every year the natural lakes with millions of fry and fingerlings. In this respect, breeders taken from each lake respectively produce the fingerlings of common carp stocked every year in Shkodra, Ohrid, and Prespa Lakes. On the other hand, in Ohrid Lake, it is now more than forty years, protection of endemic species was secured by the FD services by stocking millions of fry and small quantities of fingerlings of *Salmo letnica*, and other species.

Until 1980's, in the same lake hydrological conditions were excellent for natural reproduction of *Chondrostoma nasus ohridanus*. The changes introduced in the local hydrological system does not allow any more natural reproduction of this species.

3.1.1 Ohrid Lake

Ohrid lake is situated south-eastern of Albania and it has an altitude of 694m above sea level. The lake has an area of 348km sq. of which 118.9 belong to the Albanian territory and the rest 229.9km sq. belong to the FYROM. Out of the total surface of the lake, only 26.3km sq. or 7.3% belong to the littoral zone.

Coastal line is 87.531km long. 31.5km belong to the Albanian territory, and 56km to the FYROM. The lake has a maximum 30.3km long and 14.5km wide. Its greatest depth is 287m (the deepest in Balkans) with an average of 145.2m. The visibility of water reaches up to 21.5m of depth. The total volume of the lake is 50.5km³.

There are around 300 fishermen in the lake area. Out of them only 73 are located in the Pogradec municipality, and the others are come villages around the lakeshore. Fishing is a traditional activity

and is considered as an important resource for those living in the area. There are three hatcheries in the area, in Lin, Tushemisht and Zagorcan. Although they work without any support from the central State, they take care of maintaining good productive conditions by increasing the lake bio-mass with fingerlings.

Main species in the Ohrid lake are: Lake trout, *Salmothymus ohridanus*, Common carp, Barbell, Scobust, Bleak, *Rutilus rubilio*.

3.1.1.1 Fishery situation

Fishing in the lake is a traditional activity carried out with artisan tools and ways.

Until 1991-1992 fishing activity has been organised in groups of fishermen with a total number of 35 fishermen. After these year, the state fish farm was privatised and after February 1992, an increasingly number of illegal boats started fishing in the lake.

During 1994-1996 six private co-operatives with 120 fishermen and 60 boats were licensed. According to the most recent available data (1998) the annual fish productivity was around 140-160 tons for all species. During 1998 lake trout and Ohrid trout productivity registered a lower rate.

3.1.1.2 Actual situation

Actually there are 300 fishermen around the lake area. Out of them only 73 are from Pogradec municipality. The rest is located in the villages surrounding the lake. Only 13 fishermen, out of the existing 300, are licensed in Pogradec municipality. All the others are unlicensed and can be considered as illegally fishing.

Main species in the Ohrid lake are: Lake trout, *Salmothymus ohridanus*, Common carp, Barbell, Scobust, Bleak, *Rutilus rubilio*.

Name of species	Contribution to total production per year (%)
a. Lake trout	75
b. Bleak	10
c. Common carp	8
d. <i>Rutilus rubilio</i>	3
e. <i>Salmothymus ohridanus</i>	3
f. Scobust, Barbell	1

3.1.1.3 Equipment

Fishermen use 300 boats of different types (metallic, wooden and plastic). They are all of small dimensions and fishermen use outboard engines of 5 – 25 Hp. Wooden boats are all without engine (See table 2).

Fishermen make use of nets of different types and with a 24 – 35mm mesh size. The nets are usually of 250m length and 1.5m width.

In table 2 data on the organisational structure of fishing sector in area is reported.

3.1.1.4 Fishing system

There are three ways of fishing in the lake:

- a. *Fishing with nets*. This kind of fishing is applied into the lake. The diameter of the net hole is 24 – 35 mm (Decided by law). Fishing with nets includes selective fishing – when nets are put in a circle way and “corridors” when the nets are put in a line way.
- b. *Bleak catching*. This is a specific kind of fishing and it is used only for bleak. It is called “fishing with lights” because it is applied during the night, according to the daily horizontal emigration of the bleak. Fishermen use specific nets to catch immediately all the school of bleak that is attracted by the light.
- c. *Hooks*. This is another type of fishing used more for big in dimension fishes. However it is used rarely and the contribute of this kind of fishing is therefore low in the total productivity.

Type of fishing	Contribute to total production(%)
a. Fishing with nets	80
b. Bleak catching	15
c. Hooks	5

3.1.1.5 Catch per Unit Effort

In the Ohrid lake one unit effort is compounded by: one fisherman with one boat and two nets of dimensions 200m length and 1.5m depth. They fish around 10 hours per day and 150 days per year. Daily catchment varies 20 – 60 kg per day. There is a difference in the CPUE between boats without engine and with engine. For the first group the CPUE value is estimate to be 3 times lower than the second one.

3.1.2 Shkodra Lake

The lake of Shkodra is the biggest in Balkan and its biological resources are considered to be important, thus they need to be conserved and developed in future.

The lake of Shkodra is situated north of Albania 19.30 grades east and 42 grades north. Its boundaries are as follow:

North - Montenegro and Hat village

South - Shkodra city

East - Bajza, Shegan, kamice, Vokr, Vrake village and the city of Koplík

West - Zogaj, Shiroke villages and Buna river. This side of the lake is rocky and near of it is the Tarabosh mountain.

Dimensions

Surface (ha)	Max length (m)	Max width (m)	Max depth (m)	Average depth (m)
36800	45000	8000	45	8

3.1.2.1 Fishery situation

In the past fishery activities were managed by Ex-Fishery Enterprise of Shkodra. Fishing was regulated and implemented by law. There were about 300 fishermen fishing in this lake.

Fishing equipment included: nets, manual trawls, eel traps, fishweir etc. The average annual production was 1900 tons. The main species are: Alborella, Carpio, Carassius, Mugil, Anguilla, Alosa, Perca, Hyphthalmichthes, Sturgeon.

3.1.2.2 Actual situation

Actually there are about 206 fishermen fishing in Shkodra lake. They are licensed and have 65 boats. Beside, there is also a large segment of fishermen fishing illegally.

There are no units for gathering, manufacturing and trading fish.

3.1.2.3 Fishery equipment

The following are the equipment used by fishermen in the lake:

- wooden boats 5 m long without engine
- fish nets having 22-24 mm and 28-32 mm mesh size, manual trawl, eel traps, fishweir

3.1.2.4 Catch per unit effort

A unit of effort is defined here by 3 fishermen, 1 boat, a net 250 m long, 1.5 m wide. The number of boats active in the lake is 65.

Each unit has the following fishing days schedule:

Jan	Feb	Marc	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
10	10	12	10	20	25	25	25	20	20	15	10

Thus the total working days is 202. The total annual production is 986.700 kg. While the number of fishermen active in the lagoon is 206. The value of CPUE is 71.2 kg/unit.

3.1.3 Prespa Lake

Prespa lakes system consists on two separate lake. It is situated in the south eastern corner of Albania. The system has an altitude of 850m above sea level (the highest in Balkans). It is divided from Ohrid lake by the mountain complex Mali i Thate – Galicica. The lake has an area of 285km sq. for Big Prespa lake, and 43,9km sq. for Small Prespa lake. Big Prespa is divided among three states: Albania, Greece and Macedonia. Small Prespa lake is divided between Albania and Greece.

Fishing is one of the main economic activities in the area. At the moment there are 86 fishermen from all the villages fishing in the lake. They are not organised and the activity is carried out on individual base. Since they are not licensed, their activity is considered as illegal.

High value fish caught in Prespa lake are: Common carp, Bleak, Scobust, and Barbell. Before 1990 about 200 tons were caught each year, (see table 1) but the recorded catch has been dropping during last years. The production is destined totally to the local market. In the area there is a hatchery in Zagorcan that produces carp fingerlings. Its working capacity is 300 000 fingerlings per year. There is no storage facilities in the lakeshore and no processing machinery.

3.1.3.1 Fishery situation

The fishing sector of the Prespa lake used to be under the administrative structure of the state enterprise “NRZP - Korce” until 1991. This was organised in two groups, concentrated in Gorica and Liqenas commune.

Fishing activity in the lake started as an organised activity since 1948. After 1960 new actions were introduced such as:

- improvement of fishing techniques and equipment,
- use of fingerlings to enrich fishery production in the lake

After 1965 there were improvements in the fishing equipment. All cotton nets were substituted by synthetic material. Also vessels were equipped with 45 – 80Hp engines. For the first time fishing was carried out by using light during night-time.

3.1.3.2 Actual situation

At the present there are 86 fishermen in the Prespa lake. They are all unlicensed so that their activity is considered as illegal.

Main species in the lake are common carp, bleak, scobust, and barbell.

Name of species	Contribution to total production per year (%)
a) Bleak	80
b) Common carp	8 - 10
c) Scobust, Barbell	10 - 12

Source: Fishery inspectorate in Korca.

3.1.3.3 Equipment

The fishermen use small wooden boats for fishing. There are in total 76 boats operating in the area. Out of them 390 are without engine and 46 are with engine type out of board, 5 – 15 Hp. They use also synthetic nets of different diameters for carp, scobust and barbell. Specific nets are used for bleak.

There are no storage facilities in the lakeshore for gathering the fish. So the fishermen sell the production in the local market privately.

3.1.3.4 Fishing system

There are three ways of fishing in the lake:

- a) *Fishing with nets*. The diameter of the net hole is 22 – 36 mm (Decided by law). Fishing with nets includes selective fishing – when nets are set in a circle way and “corridors” when the nets are set in line.
- b) *Bleak catching*. This is a specific kind of fishing and it is used only for bleak. It is called “fishing with lights” because it is carried out during the night, according to the daily horizontal emigration of the bleak. Fishermen use specific nets to catch immediately all the school of bleak attracted by the light.
- c) *Hooks*. This is another type of fishing used more to catch large dimension fishes. However it is used rarely and its contribution to total landings is low.

Type of fishing	Contribution to total production(%)
a) Fishing with nets	50
b) Bleak catching	40
c) Hooks	10

In the area also operates an hatchery i Zvezda. Production is concentrated on carp fingerlings totalling 300.000 units per year which are used for restocking in the lake. This hatchery is under the responsibility of Fishery Research Institute in Durres.

3.1.3.5 Catch per Unit Effort

In the Prespa lake one unit effort is defined by one fisherman with one boat and two nets of dimensions 200m length and 1.5m depth. The average fishing time is around 10 hours per day for 120 days per year. Daily catch varies 30 –40 kg per day. There is a difference in the CPUE between boats without engine and with engine. For the first group the CPUE value is estimate to be 2 times lower than the second one.

3.1.4 Future Management Priorities

The lake fisheries need to approach some specific priorities related with present constraints and problems. According to the nature of these problems, they can be divided in the following groups:

- a) *Infrastructure*. A major problem is the need for stocking facilities in order to make possible the storage of production and create market opportunities. Another problem is the way how to improve the drainage system of agriculture and introduce new working processes in order to maintain waters flowing in and out the lake basin at an acceptable level.
- b) *Legislative aspect*. Fishermen are all fishing without a licence and legally they are considered as outlaws. Since they are all unlicensed they use different illegal ways of fishing. In this conditions is very difficult to organise fishery in the area since there are many other social problems and the lake is one of the few food resources for the population in the area. The existing fishing law gives some general guidelines so it is open to misunderstandings and abuse. A specific regulation should be implemented in order to control fishing effort and manage resources.
- c) *Economical aspect*. A disproportion between supply, which is bigger in winter and demand, which is higher in summer exists and market fluctuations result to be high. Moreover, because of the absence of an organised market place fishermen are compelled to sell their produce without any chance to add value at their landings.

3.1.5 FD Management Actions

FD aims at implementing a better control and rational utilisation of the lake resources. The implementation of the licensing system is the first step towards a rationale exploitation of fish stock. Furthermore, a set of rules should be introduced in order to set up a sound management policy which could be based on:

- Preventing fishing during the natural reproduction period
- Decreasing the unit catch rate
- Preventing fishing in specific zones all over the year

To achieve the targets set by this policy, the FD intends to involve local fishermen associations and authorities to assume responsibility of the management under the supervision of the Ministry of Agriculture and Food. The promulgation of administrative guidelines for common strategy in protecting the ecosystems should raise the awareness of local authorities and fishermen for a further and more effective future co-ordination and co-operation.

FD recognise, in fact, that local action could allow to pursue more specific objectives:

- (a) protection and enrichment of autochthonous fish reserves such as common carp and scobust
- (b) inhibition of stocking other fish species in the lake in order to avoid the disturbance of natural equilibrium
- (c) protection and maintaining of zones where fish species pass the cold winter period
- (d) gathering statistical data

Respect of the guidelines could prelude to the introduction of a micro credit scheme that should be launched to favour investments for re-stocking, storage and marketing.

Moreover, the management of Prespa Lake requires more incisive action at international level. It is mandatory to promote an interstate agreement among the neighbouring countries finalised to coordinate and regulate the water use. At the same time the natural water flow from the Small Prespa to Big Prespa lake must not be interrupted by whatsoever reason. Finally FD intends to establish a network for monitoring the quality of the water of the lake, which can be carried out through cooperation of research institutes of Albania, Greece and Macedonia.

3.2 Artificial Basin Fisheries: reservoirs, dams and artificial lakes

The presence of the mountain barriers before the rivers, as well as impervious bedrock for dam sites, provide good condition for reservoirs in Albania's upland basins. This one of the reasons which brought to the construction of quite a few hydroelectric power stations and the total surface of artificial lakes is about 7000 ha.

The most important species of fish in this lakes are cyprinids like bleak (*Alburnus albidus*), Chinese carps etc. In only one of them, Fierza Lake (5000 ha) shared with former Yugoslavia, at the beginnings of 1980's there were been introduced two other species: pike perch *Stizostedion lucioperca* and perch *Perca fluviatilis*. The pikeperch has found very good condition for both natural reproduction and feeding. The fish catch (mostly bleak) is now reduced from 200 ton per year to 50 ton (mostly pike perch) but the value of the fish is higher.

On the other hand there are some 6000 small reservoirs covering a total surface of 2700 ha. Besides the irrigation purpose, in these reservoirs a large extensive aquaculture sector has been developed and the fish production of Chinese carp family (especially silver carp and big head carp) varied from 500 to 800 ton per year. Now the estimated production is about 200 ton/year.

Until 1990 the central government, owner of the all fish farming centers, with a total surface of 215 ha, took responsibility for restocking of the reservoirs, natural and artificial lakes. The most important species stocked are Chinese carps (*Hyphophtalmichthys molitrix*, *Aristichthys nobilis*, *Ctenopharyngodon idella*, *Megalobrama amblycephala*), common carp (*Cyprinus carpio*) and "koran" *Salmo letnica*. Wild caught fingerlings of grey mullets (*Mugil cephalus* and *Liza ramada*) are used to restock some reservoirs in southern part of Albania. After 1990, only the restocking of natural lakes is taken over by limited public funds, while single or group of fishermen stock the reservoirs. In order to further incentivate restocking activities by organised fishermen FD intends to promote a micro-credit scheme aiming to guarantee rotating funds availability.

3.2.1 Shkopte Lake

This artificial lake has been constructed for hydropower purposes and not for fishery. It was constructed in 1960 on Mat river.

This lake is situated in north east of Albania, 22 km far from the city of Burrel and is connected with it through the main road. It is an artificial lake built on Mat river bed about 2 or 3 km far from Ulza lake. Its area is about 8 squared km and its boundaries are: north, south and west - the Shkopet village, east - Ulza village.

Surface (ha)	Max length (m)	Max width (m)	Max depth (m)	Average depth (m)
80	N/A	N/A	50	48

Technical data

Rainfalls (mm)	Air temp (⁰ C)	Water temp (⁰ C)	Salinity	O2 mg/liter	PH
1200	12	12	N/A	N/A	N/A

3.2.1.1 Fishery situation

The lake was administered by ex-NRZP of Ulez, Lezha. There were not permanent fishing groups, and the fishermen used nets 24 mm and navigation boats (wooden boats, 5 m long). The main specie caught was alborella. At the moment there is some fishing, but information is incomplete.

3.2.1.2 Actual situation

There is no regular administration in this lake. Nobody from those actually fishing in the lake has a license. The main fish species living in this lake are: cyprinus carpio, ctenopharingodon idella, hypophthalmichthys mollitrix, salmo montegrins, aristichthys nobilis, carassius carassius, megalabrama terminalis, megalabrama pekinensis, gobio gobio albanicus, gobius gobius lopidolamia, albrunus albrunus alborella, condrostom nasus nasus, lecensius cephalus albus, anguilla anguilla

The average annual production is estimated to be 4 tons divided as shown in annexe.

3.2.1.3 Fishery Equipment

Fishermen use 22 mm nets and some particular nets of 45 mm. Also they use wooden boats 5 m long without engine.

3.2.1.4 Fishing system

Fishing is carried out by nets only.

3.2.1.5 Catch per unit effort

The effort unit is composed by 3 fishermen, 1 boat and a net 250 m long, 1.5 m wide and a 24 mm mesh size. The number of boats is 3.

Each unit has the following schedule of working days:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
10	10	12	10	20	25	25	25	20	20	15	10

Total number of working days is 202. Total annual production is 4,000 kg. Number of fishermen fishing in the lake is 9. The value of CPUE is 6.6 kg/unit.

The value of CPUE is calculated as follow:

Number of fishermen 9 is divided by 3 and we get number of units. Production 4,000 is divided by number of working days and then by number of units.

3.2.2 Uleza Lake

This lake was constructed on Mat river in 1950 for hydropower purposes and not for fishery.

Uleza Lake is in the north of Albania about 20 km far from Burrel city. Its boundaries are: north - Ujshtrreze village, east - Urake village, south - Bushkash, west - Ulez.

Dimensions

Surface (ha)	Max length (m)	Max width (m)	Max depth (m)	Average depth (m)
150	6000	4000	80	64

Technical data

Rainfalls (mm)	Air temp (⁰ C)	Water temp (⁰ C)	Salinity	O2 mg/liter	PH
1200	12	N/A	N/A	N/A	N/A

3.2.2.1 Fishery situation

The fishery activity has been managed by NRZP of Ulza and a fishing enterprise in Shengjin. Fishing used to be carried out according the existing law and regulation. Until a few year ago, the average annual production was about 30 tons. The main specie landed were hypophthalmichthys molitrix, albranus albranus alborella, ciprinus carpio, carassius etc.

3.2.2.2 Actual situation

There is no management of fishing activities nowadays. Nobody is licensed for this activity. There is no fishing gathering units and no quay for anchoring boats. Actually there are 30 fishermen working with 10 boats and catching 23, 8 tons of fish in 1999. Catch in Uleza is as follow:

Name of specie	Percentage caught
Hypophthalmichthys molitrix	40%
Carpio	20%
Alborella	30%
Contrastoma nasus	5%
Carassius	5%

Source: FD survey

3.2.2.3 Fishery equipment

The fishery equipment consist of:

- wooden boats, 5 m long, without engine
- fishing nets with mesh size diameter of 24 mm.

3.2.2.4 Fishing system

The types of fishing in this lake are:

- nets
- trawl

3.2.2.5 Catch per unit effort

A unit consist of: 3 fishermen, 1 boat, a net 250 m long, 1.5 m wide and 24 mm mesh size. Number of boats is 10.

Each unit has the following fishing schedule:

Jan	Feb	Marc	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
10	10	12	10	20	25	25	25	20	20	15	10

Source: survey and self-assessment

Thus the total of working days is 202. The total annual production is 23800 kg. Number of fishermen 30. The value of CPUE is 11.7 kg/unit.

3.2.3 Vau i Dejes Lake

The lake of Vau i Dejes is an artificial lake built on Drini river bed in 1960.

The lake of Vau i Dejes is in the north of Albania 20 km south-east of Shkodra city. Its boundaries are the villages of Mjede and Lac.

Dimensions

Surface (ha)	Max length (m)	Max width (m)	Max depth (m)	Average depth (m)
247	6000	3000	70	60

Technical data

Rainfalls (mm)	Air temp (⁰ C)	Water temp (⁰ C)	Salinity	O2 mg/liter	PH
1800	14	12	N/A	8-8.2	8-12.5

3.2.3.1 Fishery situation

Ex-Fishery Enterprise of Shkodra managed activities until 1991. Fishing was regulated and implemented by law. There were about 30 tons fished per year.

The fishing equipment included: nets, manual trawls, etc.

The main species are: *Alborella alborella*, *Cyprinus Carpio*, *Carassius carassius*, *Alosa falax nilotica*, *Perca fluviatilis*, *Hyphthalmichthes molitrix*. The fingerlings that used to be introduced were *cyprinus carpio*, *carassius carassius*, *hyphthalmichthes molitrix*.

3.2.3.2 Actual situation

There is no management in fishery. Actually there are about 15 fishermen fishing in the lake. They are not licensed and have 5 wooden boats without engine.

There are no units for gathering, manufacturing and trading of fish.

3.2.3.3 Fishery equipment

The equipment used to carry out fishing are the following:

- wooden boats 5 m long without engine
- Nets with mesh size of 22-28 mm, 28-45 mm, manual trawl 210 m long

3.2.3.4 Fishery system

Fishing is done only by nets and manual trawls.

3.2.3.5 Catch per unit effort

A unit consist of: 3 fishermen, 1 boat, a net 250 m long, 1.5 m wide and diameter 24 mm. Number of boats 5.

Each unit has the following fishing schedule:

Jan	Feb	Marc	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
10	10	12	10	20	25	25	25	20	20	15	10

Source: FD survey

Thus total working days are 202. The total annual production is 15000 kg. Number of fishermen fishing in the lake is 15. The value of CPUE is 24.7 kg/unit.

The value of CPUE is calculated as follow:

Number of fishermen divided by 3 gives the number of units. 15 000 divided by number of working days and number of units give the value of CPUE.

3.2.3.6 Conclusions on Future Management Priorities

The major problems faced in artificial lakes concern the definition and implementation of clear rules to exploit the resources. At the present, there are no specific articles in the Albanian law "On fishery and Aquaculture" regarding these fisheries and sanctions for performing this activity in inland waters. Anyway the FD in collaboration with its own inspectors have released specific regulation in order to organise the activity of fishery in each respective areas. As matter of fact, the lack of specific rules concerning water utilisation has allowed the opportunity to commit abuse without any sanction foreseen.

It is for these reasons that many of the reported needs for a more efficient exploitation of the lakes and reservoirs have never been solved. Apart from lakes exploitation licences and ownership problems, which are by large one of impediments to a rationale exploitation, there are many other issues which deserve to be tackled by the FD. In particular, it is urgent to find solutions to the following aspects:

- Obsolete fishing equipment,
- Improvement of fingerling restocking,
- Construction of a quays for boat anchoring need to be

SECTION II

1. AQUACULTURE

Aquaculture in Albania started at the end of sixties, originally based on common carp, Then Chinese carps was introduced at the beginning of seventies. Cold water salmonids, *Salmo letnica* and *Oncorhynchus mykiss* are another important group amongst the aquaculture production in Albania. Mollusc culture (especially *M. galloprovincialis*) began more recently and the average production was about 2000 tons/year.

The central government, owner of all fish farms, with a total surface of 215 ha, was responsible for the restocking of the reservoirs, natural and artificial lakes until 1990 (See table).

After this year, due to the economical and political transition period, the production declined sharply, but the last two years showed a positive trend.

At present aquaculture policy is included in the Fishery Sector Development Strategy, as part of GREEN STRATEGY, approved by the Government in 1998. The Aquaculture Action Plan (AAP), being part of the Fisheries Management Plan, represents the first step for aquaculture development and it will be mainly based on a pragmatic approach elaborated by the Fishery Directorate.

The Albanian law N. 7908 "On Fishery and Aquaculture" assumes all the principles of the FAO Code of Conduct for Responsible Fisheries, but some difficulties to implement and to put it in practice are registered.

Indeed, the need for responsible aquaculture production is accepted and understood by central government and scientific Institutes, even if administrative overlapping and interference with local authorities are limiting its implementation with poor results in terms of resources overexploitation. Partially, this is due to uncertainties with the interpretation of the law itself, which allow local authorities issuing quite an high number of licences due to the existing high rate of unemployment. The problem exists in the lake of Ohrid and Shkodra where over-fishing is evident. The problem requires public authorities to take adequate management decisions since endemic species, like *Salmo letnica* (Ohrid lake) and few specimen of sturgeons *A. sturio* and *A. nacarii* (Shkodra lake) live in these lakes.

Another constrains for responsible aquaculture development is to be found in the lack of a law for the use of the land and water for aquaculture purpose. All the regulations in this matter (use of land and water) are included in the legal environment framework, but there is nothing specific for the aquaculture.

1.1 Freshwater aquaculture

During the previous regime the freshwater aquaculture industry received considerable attention and support. The industry was based on the culture of the most common cyprinid species (e.g. common and Chinese carps). A long period of collaboration and exchange of expertise with their Chinese counterparts enabled the Albanian authorities to successfully acquire carp poly-culture techniques and training of local experts.

The industry basically consisted of a network of hatcheries mostly constructed in the period 1986-88. Two types of hatcheries existed. The larger facilities were fitted with usually two concrete oval-shaped spawning/egg collection tanks (Chinese design) and a dedicated building for the incubation of the embryo and larvae. Spawning in the smaller facilities was simply achieved in earth ponds. Here the fertilised eggs where collected using Juniper branches. In the last full production season of 1989-90

about 32 million carp (all species) fingerlings (average size 8-10 gr./piece) were produced. Fingerling production per hectare averaged 120,000 pieces.

Most of the fingerlings produced were used for re-stocking natural/artificial lakes, reservoirs and dams, while a smaller percentage were kept for on-growing on a few farms including the large centres of Rec-Pulaj (110 ha), Durrës (200 ha), Kavajë (215 ha) and Narta (200 ha). The stocking densities varied according to the size of the water bodies and their eco-biological characteristics. Natural/artificial lakes were stocked with the lowest densities (500-1000 fingerlings/ha), smaller reservoirs with 2000-3000 unit/ha whilst farms with densities of up to 10,000 fingerlings/ha. Fish farms production ranged between 2-3 mt/ha/season. The species stocking ratios were approximately as shown in Table 1.1 below.

Table 1.1 - Species Stocking Ratios in Selected Water Bodies

Carp Main Species	Natural/Artificial Lakes	Reservoirs	Farms
Silver carp	80 %	80 %	50-60 %
Big-head carp			5-10 %
Common carp	20 %	20 %	30-40 %
Grass carp			

Table 1.2 lists all of the existing facilities up-to date excluding small farms which may have not been registered. Many of the state-owned farms stopped operating in the early '90s due to the internal conflict at the time. Since then a large number of these facilities (15 based on the information collected) has been fully privatised, while an additional 10 farms are undergoing privatisation. At present only few facilities are currently working and producing fingerlings for sale to private farmers and to the State for their reduced but still on-going re-stocking programme. The current annual fingerling production is estimated at around 3-4 million as many of the existing ponds (private and state-owned) are not in production the main reason possibly being the lack of investment capital to renovate the facilities and initiate commercial production. Current fingerling (8-12 gr./pc) price range from 5-8 Lek/pc (USD 0.037-0.060) depending on the species.

Among the facilities listed in Table 1.2 some have been retained by the Government and are under the administration of the Fishery Research Institute in Durrës. The facility in Tapize (Kruje District) is mainly used as a genetic bank to preserve carp genotypes although the facility currently produces approx. 350,000 fingerlings mainly of big-head and common carps. Two additional facilities are managed by the same Institute exclusively for the production of fingerlings for re-stocking. Current production is below the capacity of the two farms and around 600,000.

In addition to the carps, trout has also played a role in the Albanian aquaculture industry. The largest commercial rainbow trout on-growing facility was built in the vicinity of the port town of Sarandë covering an area of approximately 4 ha and strategically located near the abundant spring known as 'Blue-Eye'. Attached to this operation was a hatchery located in the vicinity of the village of Muzine around 18 km away. Both facilities have been since privatised, but the current owners (25 individuals) have not been so far able to start production. An attempt to enter into a joint venture with a foreign investor (Israel) was not successful after an initial period.

Few trout farms are currently in operation including a small farm in district of Delvinë (8 concrete tanks of 50 m³ each) and a slightly larger one in the northern district of Dibër. Both farms import fertilised eggs from neighbouring countries (Greece and Macedonia) at around USD 3.4 for 100 eggs. Wholesale price of commercial fish (around 300-350 gr.) currently fetches 450-470 Lek/kg (USD 3.4-3.6). Feed is also imported (mainly from Elviz SA in Greece, but also from Italy) at an average cost of 180 Lek/kg (USD 1.36). Custom duties are 5% while import tax is 20% (a 5% tax on feed imports is

under consideration). The entrepreneur operating in Dibër has expressed keen interest in producing eggs locally.

Among the other salmonid species of interest in Albania is the ‘Koran’ trout which is an endemic in the Lake of Ohrit (shared with Macedonia). Four sub-species have been identified (characterised by different reproduction periods), however it is the *Salmo letnica tipicus* that is currently reproduced in the only state-owned facilities in the localities of Lin and Tushemisht on the lake. The main output comes from the hatchery in Lin which produces annually approximately 300.000 fingerlings of 4-5 gr. Eggs are collected from mature females fished by local fishermen during the closed fishing season from December-March. All fingerlings are used for restocking.

Table 1.2 - Existing Freshwater Fish Hatcheries and Grow-Out Facilities

Farm Name	District/Locality ⁽¹⁾	Surface ⁽²⁾	Hatchery ⁽³⁾	Species	Ownership	Working
Grizha	M. Madhe / Demiraj	5.2	Concrete	Carp	Private	No
Vraka	Shkoder / Shtoji R.	4.8	Concrete	Carp	Private	No
Shtodri	Shkoder / Mes	6.5	Concrete	Carp	Under Privatisation	No
Vauidejes	Shkoder / Vauidejes	3.8	Pond	Carp	Private	Yes
Rec-Pulaj	Shkoder / Rec	110.0	Concrete	Carp	Private	No
Shtigen	Kukes / Shtigen	12.0	Concrete	Carp	Under Privatisation	No
Laknas	Tirane / ILB	20.0	Concrete	Carp	Private	Yes
Urake	Mat / Urake	15.0	Concrete	Carp	Under Privatisation	No
Tapize	Kruje / Tapize	3.1	Concrete	Carp	Fishery Institute, Durrës	Yes
Balltren	Lezha / Balltren	10.0	Concrete	Carp	Under Privatisation	No
Durrës	Durrës / Rrashbull	115.0	Concrete	Carp	Under Privatisation	No
Kavaje	Kavaje / Karpen	215.0	Concrete	Shrimp	Italian Joint-Venture	Yes
Tushemisht/ Lin	Pogradec / Tush./Lin	0.7	Concrete	Koran	Fishery Institute, Durrës	Yes
Zvezde	Korce / Zverde	3.6	Pond	Carp	Fishery Institute, Durrës	Yes
Gurras	Pogradec / Gurras	8.0	Pond	Carp	Fishery Institute, Durrës	Yes
Zagorcan	Pogradec / Gurras	2.5	Pond	Carp	Under Privatisation	No
Mollas	Elbasan / Mollas	12.0	Concrete	Carp	Private	Yes
Thane	Lushnje / Thane	15.0	Concrete	Carp	Private	No
Toshkez	Lushnje / Toshkez	20.0	---	Carp	Private	No
Kurjan	Fier / Kurjan	12.0	Concrete	Carp	Under Privatisation	No
Izvor	Vlore / Orikum	5.0	Concrete	Carp	Private	No
Narta	Vlore / Panaja	200.0	Concrete	Carp	Private	No
Boboshtica	Korce / Boboshtica	20.0	Concrete	Carp	Under Privatisation	No
Gorican	Berat / Gorican	3.5	Concrete	Carp	Private	No
Mavropull	Sarande / Xarrë	15.0	Concrete	Carp	Under Privatisation	No
Muzine	Delvine / Muzine	0.2	Concrete	Trout	Private	No
Syri Kalter	Delvine / Kronjgj	1.0	Concrete	Trout	Private	No
Vrion	Delvine / Vrion	4.0	---	Trout	Private	No
Trofta-Lura	Diber / Arras	0.2	---	Trout	Private	Yes
Doftie	Gjirokaster / Libohove	10.0	Concrete	Carp	Private	No

(1) Many of the existing freshwater fish farms take their name from the locality nearest to the sites; some farms are not exactly in the locality listed in the table, however the nearest town has been chosen as a reference point. (2) The surface areas below indicate the water surface in each farm; in some cases the value may comprise the whole surface area of the farm. (3) In all carp farms the hatchery comprises concrete oval-shape tanks for brood stock spawning (usually 2) and a small hatchery building with up-welling tubes.

1.1.1 Actual situation

With the beginning of privatisation process all the hatcheries and fish farms, both for carps and trout cultivation, were privatised, but few of them are today in operation. So now there are working 3 hatcheries with a total surface of about 40 ha and a yearly production of about 3 million fingerlings. This sharp decline in fingerlings production occurs due to the political and economical transition period (absence of legal framework and financial support, land ownership problem, water price liberalisation etc.). On the other hand, the lack in fingerlings production influence the poor stocking rate of the reservoirs, natural and artificial lakes, and directly the fish catch. Besides licensed professional fishermen, there are some illegal and abusive fishermen in these ecosystems, so the problem is more complicated and the fish production is fallen down.

1.1.2 Future Management Priorities

The first priority concerns the need to rehabilitate the hatcheries of larvae and fingerlings production. The availability of fingerlings should, in fact, guarantee both restocking and start up of commercial freshwater aquaculture. In this framework, it is believed that it is both in the interests of the country and in those of commercial aquaculture ventures that they be successful, ie, profitable, but without creating costs to the Albanian economy, either by causing aquatic pollution or introducing diseases that affect other users of the marine or freshwater environments. Suitable sites for aquatic aquaculture are limited and the development of water use in the most profitable manner possible is a priority for the government.

Another constraints to further develop aquaculture in Albania is the lack of credit line and investments. The lack of financial support during the last years has blocked the greatest part of the existing fish farms. FD is trying to protect the last specimen of sturgeon (*A. sturio*) and public or private funds should be raised to finance a project allowing its artificial reproduction and growth: implementation of micro-credit scheme represents an important key factor also for the Aquaculture Action Plan.

Aquaculture is only one activity that must be considered within the integrated management of Albania's freshwaters. In the framework of the GREEN STRATEGY, it is clear that there is a low priority for land and water resource use with respect to agriculture. Besides this, potential conflicts in resource use are there. Tourism industry, landowners, harbour authorities, and military authorities are all involved in these resources utilisation. In such a situation FD is not the only government department with a mandate for management of the coastal region and many freshwater areas. Other government department's, notably that of the Ministry of the Environment, also have responsibilities for environmental protection that includes coastal and freshwater areas and they, too, are concerned with the potential impacts of aquaculture operations (escape of cultured fish, disease outbreaks and the need their control, need to control predators, eg, birds or other predators).

At last but not least, a sound management aquaculture policy, require the Directorate to develop an internal capacity to assess and monitor the activities of all aquaculture operators: fisheries inspectors should be involved in this activity through an adequate formation.

1.1.3 FD Management Actions

The main considerations in relation to leases of public owned areas for aquaculture activities concern the period of the lease, the payment to be received by the state and controls on transfer of leases. It is very much the intention of the government that applicants for leases should be bona fide, thus applications to lease aquaculture sites must be accompanied by acceptable business development plans.

A major concern of the FD will be that of enterprises leasing for freshwater sites which are either unproductive or not operational. FD intends to require acceptable assurances of competency and certain levels of output though it is recognised that unanticipated difficulties can be encountered in new operations and a pragmatic attitude will determine FD's approach to these problems. In evaluating possible management options the FD recognises that commercial operators need legal assurance that they will be able to operate in a particular site for an extended period, at least in the range of the economic life of their capital investments. Without this, finance may be impossible and the Country would forgo the benefits accruing from profitable productive investments. However, it is also important that in case an enterprise fail, the government will not be left with liabilities for removal of valueless buildings, chemicals or waste products, possibly dangerous installations, or that the FD should undertake expensive programmes to deal with diseased stocks, or the effects of disease epidemics.

The rights to use a site for aquaculture should be for a limited period, but automatically renewable, subject to the operator satisfying the conditions of the lease, perpetual rights to the site would remain with the government.

1.2 Aquaculture in lagoons and estuarine waters

Albanian coastal lagoons have rich ecosystems and have a higher biological productivity compared to the sea. Supporting the development of aquaculture in Albanian coastal lagoon is justified as the country is blessed with a long and pristine coastline and an abundance of quality water sources.

The interest in promoting Albanian aquaculture in lagoons, particularly the culture of molluscs and marine species, is often closely related to the possibility of earning hard currency by exporting the products into lucrative markets. High demand and close export markets exist for species such as sea bass and sea bream, for ornamental and recreational markets and for a large variety of live shellfish including both crustaceans and bivalves.

Since 1980 Albania, has been distinguished for the production and the exportation of molluscs with particular emphasis on bivalve molluscs and other marine molluscs such as clam, tellina, oysters. Those products were of particular importance for the Albanian exports in general and were pretty much profitable for the national economy in general.

1.2.1 Land based coastal aquaculture

The farming of marine species is not developed in Albania. There is only one extensive shrimp culture farming at Kavaja with a total surface of 215 ha. It was built 30 years ago and the main production until 1992 were fingerlings and Chinese carps. In 1994 a joint venture with Italian partners named "KAP" (Kavaja Aquaculture Production) was founded. The majority of the company (K.A.P. sh.p.k.) is owned by foreign investors (75%), while the remaining shares are held by the State. The company has managed the reconstruction of the farm and is now working on a surface of 120 ha for extensive cultivation of shrimp *Peneaus japonicus*. The post-larvae were originally imported from Greece, while all of the seed material is now produced locally in the farm's own hatchery using the eye-ablation technique. Stocking densities are low with a maximum of 1.5 Pl₂₅/m². Seeding is carried out in June/July while harvesting occurs in September/October. In 1998 approximately 10 mt (shrimp size 25-35 gr.) were produced from 80 ha. Current ex-farm sale price range between USD 10.75 - 13.45/kg. In the near future, it is foreseen that half of the farm will continue to produce shrimp and the other half will start farming species like sea bass and sea bream.

Recently, there are some attempts by owners of Narta fish farm (200 ha) to put it in operation by founding a JV with Italian partners. Being near to the sea this fish farm shows some advantage for foreigner investors.

1.2.2 Future management priorities

Live fish exports from Albania into the European Union (EU) are not currently permitted. Efforts should be oriented into reversing this trend as this would most certainly encourage and provide an adequate incentive to all those entrepreneurs interested in investing in aquaculture. A number of activities in this direction are under way and are supported by the donor community. However, further assistance may be required to establish an effective national system for the treatment of cultured and wild bivalves.

1.2.3 FD Management Actions

The objective of the FD will be to encourage fish farmers operating in lagoon aquaculture to maintain the natural equilibrium in those areas. The FD intends also ensure that aquaculture operations are compatible with protection of the environment and do not harm the natural functions of the lagoon in coastal ecosystems, eg, preventing from an excessive catch of juveniles in nursery areas.

Financial and human resources within the FD are not sufficient today and require an effort which has been planned. In particular, monitoring and regulation of lagoon fisheries will be an important part of the duties of the Fisheries Inspectorate.

1.3 Mussel farming

Mussel farming has been developed in Butrinti lagoon only. Before 90's it was organised as State enterprise, employing 250 people and mussel harvesting reached 5,000 tons annually. During the eighties apart from the bivalve molluscs other species were exported as well, through the utilisation of special fishing boats purchased on purpose. After the dystrophic crisis of 1992 the enterprise stopped its activity and never restarted. At the moment there are 7 private units dealing with mussel farming, but capacity is highly reduced, since there is no export possibilities for mussels.

Due to an irrational and intense exploitation, within a period of 5 years, the depletion of the marine mollusc stocks occurred, and a drastic decrease of production followed.

Following the outbreak of cholera in 1994, a restriction on imports of marine products was imposed and the export for such products was banned in EU.

In Butrinti, the facilities for the collection of molluscs have been totally abandoned and several of them have been destroyed during the disorders in 1997. From around 75 existing facilities in Butrinti lagoon, 35 have been damaged and it is not foreseen any rehabilitation in the near future.

At the same time, the reserves of mussels at sea are regenerated almost completely after a long period when they have not being exploited. These plants belong to the State, even if this rent has now been started. In order to export again the production, the Institute of Veterinary Research and the Fishery Research Institute have been recently equipped with the means for monitoring the sanitary parameters and water coastline. At the same time the Directorate of Veterinary and FD, both at the Ministry of

Agriculture and Food, have prepared and approved the legal framework needed to meet the EC Rule in order to reopen export markets.

1.3.1 Future Management Priorities

The reopening of exports for molluscs is a high priority either to increase financial inflows and to create job opportunities in the field. The Albanian coasts offer good opportunities for mussel farming using long line mussel ropes. This can be considered as another important activity besides the rehabilitation of the existing farming facilities in Butrinti lagoon.

This is the reason which makes it necessary to establish the monitoring system of Albanian coastal waters and respective population of bivalve molluscs. To be eligible to export mussel to EU, it is mandatory to consolidate the monitoring system according to European requirements. The FD has to manage relationship with Dublin EU office responsible for evaluating the quality of the monitoring system applied to Albanian coastal water.

1.3.2 FD Management Actions

FD has been fully involved in establishing monitoring system of quality water and has estimated the impact deriving from resuming export opportunities:

1. The increase of the Albanian exports to the markets of the community. In the first period FD expects a minimal production from the lagoon of Butrinti of 1.000 tons, whose value is estimated to be as high as 400,000 US\$
2. The level of employment would increase considerably. In fact , mussels are collected with nets that are pulled by hand (telline, clam, etc) along the coastline. This activity can employ thousands of people directly, while other employment is required indirectly for marketing, transport, services, etc. Employment in the lagoon of Butrint is also important considering that in 90's there were 300 people working on mussels cultures.
3. The existing processing factory (IES) can be reopened.
4. The opening of the export of mussels and the categorisation of waters will also make possible the export of the live fish such as eels and fingerlings of the family of carp, whose production is by far a long standing tradition in Albania. As a global result, the rehabilitation of aquaculture farms may bring a of 300 000 US\$ extra earnings for the Albanian economy.

In conclusion, the program of activity should involve the following steps:

- a) The state responsibility. Starting from the nature of this production, State should guarantee that analyses carried out so far will remain under its responsibility. The categorisation of the waters and the areas of production (A, B, C) as well as the checking structures have to be under public control. These ask for the setting up of public structures, the strengthening of the labs at a local level (part of which has started to be set up)and the strengthening of the control, system - the inspectorate (veterinary + fishery) specific for the local area, near the potential centres of production and collection.
- b) The private responsibility will start at the moment that production will be made effective. For exporting it is necessary to set up (and actually they are being set up) a series of private structures (the centres of expedition) that have to meet the sanitary conditions. At the same time the structures of the veterinary inspectorate will check periodically the application of these conditions. All this services

will be charged to the private industry, that in order to export, should be certified for this service. (Actually similar structures exist for exporting fresh fish.

c) Of course the State will earn and cover public costs from the increase of revenues that will come from the system of licenses and different taxes that private companies will pay for exercising their activity and for guaranteeing the services that will be done by the veterinary and fishery service.

1.4 Off-shore mariculture

Mariculture in Albania has never taken off as the industry was based almost exclusively on the culture of freshwater fish species (mainly carps). The only activity that could be classified as a mariculture operation is the mussel farming project that was managed by the Durrës Fisheries Research Institute in the 1600 hectare Lagoon in Butrinti. Approximately 80 mussel racks were constructed in the 1980s. Each rack basically consists of a concrete grid measuring on average 80 m in length and 10 m wide suspended on three parallel rows of concrete poles. The racks, of which an estimated 50/60 units are in good condition, are mainly located along the western side of the lagoon where the water depth ranges between 4-6 m.

As reported above, in 1990 a maximum live weight production of around 5000 mt were achieved using ropes suspended from the racks. Most of this production was exported fresh to neighbouring countries while a small portion was processed in jars in a small plant currently out of operation. At present none of the racks is being utilised as the market (mainly Italy) for fresh bivalves into the EU is closed. Some mussel harvesting from clusters at the bottom of the lagoon occurs only for consumption in the local market.

FD is aware that a potential production could be obtained from coastal aquaculture, in particular from cage culture of fish and possibly raft culture of shellfish. There are many experiences in open sea cage culture fish farms. Even if this is not a priority for Albanian authorities since the potential production emerging from more traditional systems has not yet been fully exploited, it has been decided to analyse the existing possibilities in order to correctly evaluate any possible development in this direction.

However, part of the FD's contribution to integrated coastal zone management in Albania has consisted in the identification of potential areas for marine aquaculture.

1.4.1 Identification of potential site for off-shore mariculture

In order to facilitate the aquaculture zoning process, the Albanian coast has been divided in five sectors, each coastal sector characterised by a few parameters (e.g. coast morphology, water depth) that remained more or less constant throughout the selected stretch. The northern and southern boundaries of the five sectors along with a list of the main coastal features and brief description of the coastal topography are listed in Table (1.3). Each sector is graphically shown in Graph 1 while the coordinates are shown in Table (1.4). Most of the coast of Albania is exposed to the open sea and both northerly and southerly winds. In general, the country has a limited number of protected bays or sites for mariculture purposes. On the other hand, extended shallow coastal plains and large lagoons favour the establishment of 'land-based' structures such as earth ponds for both extensive and semi-intensive culture systems. Sectors I, II and III have the most abundant sites deemed suitable for land-based aquaculture along with five of the largest lagoon systems in the country. Much of the sites selected are currently poorly exploited. This is due to the fact these sites require some major engineering intervention to allow proper and effective water circulation, required in all aquaculture operation.

With regards to sites suitable for mariculture activities these have been identified in all sectors except Sector III mainly due to the exposed coast and relatively shallow sea slope gradient. With the technologies available today, floating and/or submersible net-cages and long-lines can be set-up in areas with rather extreme environmental conditions, typically strong winds and wave action. The selection of all sites marked in the sector graphs have taken into account not only exposure of the sites, but also water depth, predominant sea currents as well as accessibility to the sites by road and sea and their vicinity to main coastal towns.

Table (1.5) provides a preliminary indication on the suitability of each site for a given aquaculture system. With regards to mariculture sites (see blue-shaded areas; M= **M**arine-Based Sites) it appears that the areas shown in the northern sectors (Sectors I and II) would mainly favour the setting-up of long-line systems for the culture of mussels (*Mytilus galloprovincialis*) and possibly other bivalves using suspended lanterns or similar structures. The seawater in these areas have a high phytoplankton concentration (large natural shellfish – mussels, clams and scallops – banks exist) and adequate water depth not too far from the seashore.

Further south (see Sectors IV and V) a number of suitable sites for establishing marine farms using net-cages have been identified. The preferred sites, among those listed in Table 3, are the south-western area of the Vlore Gulf (Porto Ragusa), the Gulf of Palermos and the relatively large area south of the Butrinti lagoon channel all the way to the Greek boarder. Butrinti lagoon is also of particular importance to the sector as, unlike the other lagoons along the coast, it is rather deep and resembles more a lake. Along the western shore of the lagoon a number of relatively large concrete racks for mussel farming exist and can be readily utilised.

The data obtained has been included in the overall GIS produced within the FD and supported by the PHARE Project.

1.4.2 Future Management Priorities

As a consequence of the zoning evaluation, the FD intends to disseminate information collected and to promote mariculture. Communication campaigns will be organised to attract potential local and foreign investors. The companies wishing to undertake coastal aquaculture will be invited to present, as part of the licensing conditions, a business plan that will include Eco Audit Management Scheme. FD expects, in fact, that mariculture should have low environmental impact and it will assist, in collaboration with suitably qualified technical agencies, the company applying for licence.

Another important issue is whether marine sites should be treated differently with respect to other property rights that exist in Albania Marine and terrestrial sites differ in their characteristics, for example marine activities can interfere with the rights of navigation, public health and environmental protection in ways that differ from those onshore and are more difficult to control and enforce. Legally, ownership of the marine areas is vested in the state and there is a need to set rules for defining the status of property in the sea.

1.4.3 FD Management Actions

There is an important need of the Directorate to develop an internal capacity to assess and monitor the activities of mariculture operators. In this framework FD intends to organise specific training for operators and it aims to involve in such task the Institute of Agronomy in Tirana.

Table 1.3 - Coastal Sectors of Albania: Main Features and Topography

Sec tors	Northern Border	Southern Border	Latitudes		Main Coastal Features	Coastal Topography
			N.	S.		
I	From: Border of Montenegro	To: Estuary of the Erzenit River including the northern section of Lalëzit Bay	N. S.	41.88.14 N 41.43.06 N	Ports: Shengjin Bays: Drinit, Rodonit, Lalëzit Lagoons: Ceke, Merxham, Patok	Mostly shallow coastal plains from the northern border with Montenegro all the way south to the rocky outcrop of Cape Rodonit. The Bay of Lalëzit from Cape Rodonit to the navy outpost on the southern end of the bay is shallow with large coastal plains. From 'Porta Romana' all the way to the port town of Durrës rocky shores with a water depth reaching 25 m within 20-30 m from the shore line. Shallow areas have all sandy beaches
II	From: Estuary of the Erzenit River including the southern part of Durrësit Bay	To: Northern border of Karavastasë Lagoon	N. S.	41.43.06 N 40.97.75 N	Ports: Durrës Bays: Durrëssit Lagoons: ---	Mostly shallow coastal plains. Southern section of Durrësit Bay rocky, including a short section on the cape of rock cliffs. Shallow sandy beach with planted pine forest north and south of Spile. Inland area is swampy. Shallow sea slope
III	From: Karavastasë Lagoon	To: Nartës Lagoon	N. S.	40.97.75 N 40.48.25 N	Ports: No major port Bays: --- Lagoons: Karavastasë, Nartës	The entire coastline is characterised by a long stretch of sandy beaches with a rather shallow coastal plain. Several large swampy areas particularly on either sides of the Semanit and Vjosës river estuary systems.
IV	From: Southern section of Nartës Lagoon	To: South of Palermo Bay	N. S.	40.48.25 N 40.02.61 N	Ports: Vlorë Bays: Vlorës, Palermos Lagoons: ---	The eastern shore of the Vlorës Bay is sandy. The entire Karaburum peninsula (western shore of the bay) up to approx. 5 km north of Palasë town is rocky. Water depth on the eastern shores of the peninsula has an average depth of 45 m at a distance of <100 from the shore. Numerous small coves. Sandy and exposed beach stretches from Palasë to the Bay of Palermos. The bay itself has mostly rocky shores and deep water (used as naval base).
V	From: South of Palermo Bay	To: Border with Greece	N. S.	40.02.61 N 39.66.91 N	Ports: Sarandë Bays: Kakomës, Sarandës, Butrintit Lagoons: Butrintit	Narrow coastal plain from the Bay of Palermos to the Bay of Kakomës. Sand/gravel beach. Most of the remaining coastal topography, all the way to the Greek border is rocky excluding short stretches north of the port town of Sarandë and along the Bay of Butrintit. Large reclaimed shallow coastal plain (> 4000 ha) south and south-east of the Butrintit Lagoon.

Table 1.4 - Geographical Co-ordinates of Potential Aquaculture Zones

Sectors	Zones	Northern Co-ordinates		Southern Co-ordinates	
		NW	NE	SW	SE
I	Zone I-1	Lat. 41.94.70 N Lon. 19.33.76 E	41.94.70 19.52.85	41.82.78 19.33.76	41.82.78 19.52.85
	Zone I-2	Lat. 41.78.83 N Lon. 19.54.22 E	41.78.83 19.65.51	41.69.61 19.54.22	41.69.61 19.65.59
	Zone I-3	Lat. 41.67.33 N Lon. 19.40.36 E	41.67.33 19.63.13	41.42.25 19.40.36	41.42.25 19.63.13
II	Zone II-1	Lat. 41.42.20 N Lon. 19.35.88 E	41.42.20 19.51.07	41.27.60 19.35.88	41.27.60 19.51.07
	Zone II-2	Lat. 41.20.90 N Lon. 19.38.42 E	41.20.90 19.55.28	40.95.91 19.38.42	40.95.91 19.55.28
III	Zone III-1	Lat. 40.98.64 N Lon. 19.39.80 E	40.98.64 19.57.50	40.75.08 19.31.53	40.75.08 19.45.12
	Zone III-2	Lat. 40.71.03 N Lon. 19.25.65 E	40.71.03 19.42.59	40.47.05 19.37.70	40.47.05 19.54.78
IV	Zone IV-1	Lat. 40.43.32 N Lon. 19.38.91 E	40.43.32 19.49.93	40.29.76 19.38.91	40.29.76 19.49.93
	Zone IV-2	Lat. 40.05.87 N Lon. 19.74.73 E	40.05.87 19.81.89	40.01.28 19.74.73	40.01.28 19.81.89
V	Zone V-1	Lat. 39.98.62 N Lon. 19.84.98 E	39.98.62 19.90.30	39.87.12 19.90.08	39.87.12 19.96.65
	Zone V-2	Lat. 39.80.73 N Lon. 19.97.81 E	39.80.73 20.09.09	39.65.50 19.94.50	39.65.50 20.04.93

Table 1.5 - Potential Aquaculture Sites According to Culture System

Sectors	Zones	Culture Systems		
		Floating Cage (Finfish)	Long-Line (Mussel)	Earth Ponds (Finfish, Shrimp)
<i>I</i>	Zone I-1	---	---	I-LB1 I-LB2
	Zone I-2	---	---	I-LB3
	Zone I-3	I-M1	I-M1 I-M2	I-LB4 I-LB5
<i>II</i>	Zone II-1	---	II-M1	II-LB1
	Zone II-2	II-M2	II-M2	II-LB2 II-LB3 II-LB4
<i>III</i>	Zone III-1	---	---	III-LB1 III-LB2
	Zone III-2	---	---	III-LB3 III-LB4 III-LB5
<i>IV</i>	Zone IV-1	IV-M1	IV-M1	IV-LB1
	Zone IV-2	IV-M2	IV-M2	---
<i>V</i>	Zone V-1	V-M1	V-M1	---
	Zone V-2	V-M3 V-M4	V-M2 (*)	V-LB1

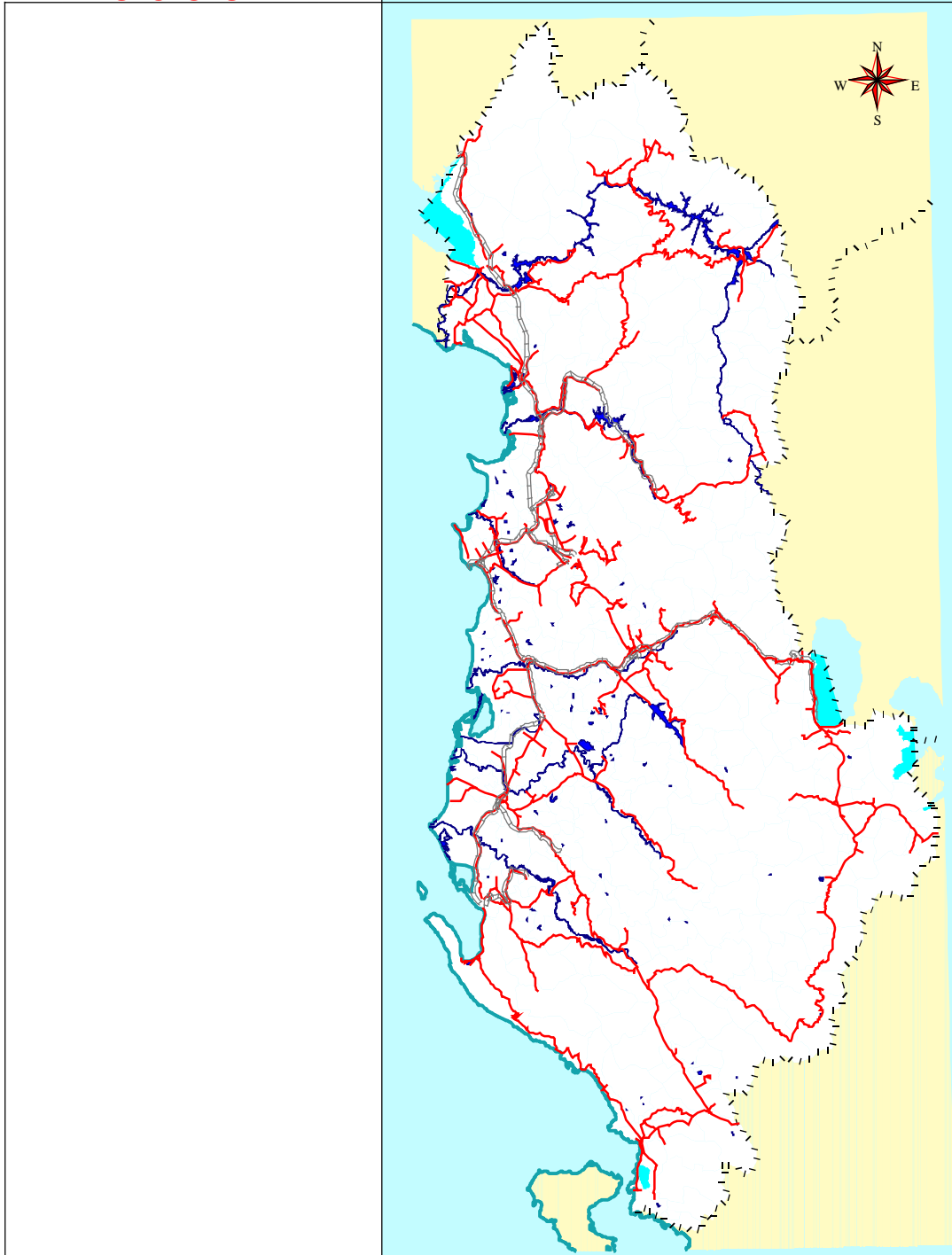
(*) Concrete mussel racks exist in the Lagoon of Butrinti.



Coastal Aquaculture in Albania

(Phare - AL97070203)

SECTORS



Alessandro Lovatelli, Aquaculture Consultant (EASTRISH)

Scale 1:3750000 0 30 60 90 Kilometers

PART II

SECTION I

1. PROCESSING INDUSTRY

At the present the Albanian processing industry is formed by three large companies producing salted anchovies (canned or in jars– not sterilised) for export: Konservimi Adriatik, Eurofish and Poseidon. The first one is located in Durres and is supposed to rehabilitate the production that is actually stopped. The others are located in Lezhe and they produce around 1,000 tons of salted anchovies and employ 349 workers. Respective processing areas amount to 2,000 and 3,000 square metres. Raw material is imported, mainly from Italy, Spain, Greece, Morocco and Argentina, and either arrives as frozen block or already salted in barrels. In this framework processing industry could play an important role both in assuring stable employment and becoming a productive market for small pelagic fisheries. Actually, such a fisheries is not exploited any more, but the demand of raw material could incentive the renewal of such fleet and therefore, the rehabilitation of this fleet has been decided to be a priority.

2. TRADE AND FISH MARKET

The distribution of fish products has undergone, in the last five years, rapid change in Albania. The route followed by fish entering the Albanian market is quite simple due to low number of operators involved in the process. Even if there is still no organised network, there has been the idea for the creation of a stronghold (main links in the distribution chain) which is believed to be necessary for the take off of the internal market.

These "links" are represented by:

1. wholesalers
2. retail and catering.

2.1 Trade sector feature

Trade sector is composed by private companies. Tab. 2.1 lists the 34 companies with some key statistics about each company. The figures should only be used to give an indication of the marketing activities. In most cases, the figures came from informal surveys rather than systematic data collection. However, with the vast majority of these companies being formed since 1990, it is shown the rapid recognition by Albanian entrepreneurs of the potential value of the marketing and processing industry as viable business ventures. In many cases, companies are prepared to invest into larger and better designed factories or in the process of upgrading and expanding their plants.

Fish trade in Albania is mainly concentrated in areas near the main harbours. These are (from north to south) Shengjin, Durres, Vlore and Sarande. The main species caught are hake, mullet, cuttlefish, squid, sea bream and sea bass.

The companies receive, process and export fresh fish products, mainly to Italy and Greece: nearly 80% of the higher-valued fish caught is estimated to be exported.

Part of the fish produced is sold on the domestic market. However, fish and fish products are not traditionally an important part of the diet of the Albanian consumer, with Albanians only consuming around 2.5kg of fish per capita per year. This makes up only around 8% of the total meat intake. The domestic market also consumes some imported fish and fish products. These imports were initially destined for consumption, and later, as mentioned above, as raw material for processing.

2.1.1 Wholesalers

In Albania there are 34 approved establishments by EU standards that carry out processing and marketing activities for fish and fish products. All these establishments are private companies.

They are located predominantly in the big urban centres and furnish the final users: restaurants, hotels, fishmongers, local and private markets; they have refrigerated premises and often their own means of distribution.

Today wholesalers represent the "demand" and this brings some associated problems. In particular, it has been experienced a strong contractual power in traders hands which allow the latter to decide on fishermen decision to go fishing. This aspect could find answers in the construction of public fish markets where demand meets supply, as it happens every where else. As matter of fact, the low number of traders led to exploit the producers, to control the market price and to encourage unhealthy trade practices. They do not, in real terms, provide services to the marketing and distribution activities. The loans they offer to fishermen are automatically deducted from the sale of products thus minimising all their risks.

The main strength of the industry relates to its status as a fully approved "third country" for the "placing on the (EU) market of fishery products". Albania has enjoyed this status for several years, and was one of the first Central and Eastern European countries to gain this status. Even today, only Russia, Estonia and Poland are also fully approved third countries.

This allows the fishing industry to export to its near neighbours, Greece and Italy, which they do on a daily basis. With the full implementation of the shellfish monitoring system and subsequent lifting of the EU ban, live mussels will also be able to be exported to the EU.

This puts Albania in a strong position compared to its neighbours.

It has to be stressed the excellent quality of the Albanian produce, also due to the widespread use of ice for fresh fish, at least in the processing plants. All factories registered for export have chill rooms (operating at between 1-4°C), and several have cold stores (-20 to -30°C).

Furthermore, most plants also have appropriate flooring (mostly coated concrete) and walls (mostly tiles) for processing fish, which do indicate the existence of the fundamental requirements for factory design and operation under good manufacturing practice. However, the state of repair of the floors and walls in many of the factories is poor, and there are some key aspects of design that are missing and which need to be upgraded.

Some weaknesses at factory level from the viewpoint of appropriate factory design and operation for export of fish to the EU can be found in the need to meet food safety perspective. This is justified given the current third country status of Albania.

2.1.2 Future Management priorities

There is a great need to organise a systematic coverage about topics regarding Hazard Analysis Control Critical Point, and especially the prerequisite programmes (sanitation and hygiene) and good factory design for the benefit of the Albanian fish processing sector. There is much expansion and building going on at present, and it would be timely to offer technical assistance in these areas to ensure that Albania is well placed to offer high quality and safe fish products for the domestic and export markets. The initial priority must be on what is often termed Good Manufacturing Practice and focus on good factory design and good hygiene/sanitation operating procedures (sometimes referred to as Standard Sanitary Operating Procedures - SSOPs).

Moreover, the FD recognise the need to train the traders and intends to organise practical workshops to cover these issues. The practical nature of the workshops will be essential in order to involve local private industry and access to their processing factories. Another priority issue, already remarked in discussing about mussel farming, which also require to be solved concern the EU shifting its ban on Albanian exports of live fish, molluscs and crustaceans to EU member countries. In this context, between 1995-97, in collaboration with the EU and via PHARE programme, funds were raised to set up fish laboratories for monitoring waters and export products in accordance to EU criteria.

A major problems remains and is relative to the exemption by the EU of a 12.5 percent customs duty on imports for Albanian products.

2.1.3 FD Management Actions

FD will aim at a better management on the whole trade sector. The role of EU tariffs is limiting the possibility of increasing the international trade. The Government aim to negotiate for the exemption of the custom duty of 12.5 percent for Albanian exports of fish processed products to the EU. The target should be at least the setting of identical conditions as those of Magreb countries.

Table 2.1 - Existing Processing Factories

EU Approval No.	Name	Town	Processing Area (m ²)	No. Employed	Production (MT p.a.)	Species	Products	Main Equipment
1	Konservimi Adriatik	Durres	5600	50-200	under rehabilitation	Sardine, anchovy	Canned, jars	-
2	Vival Novosel	Vlore		-	-	-	-	-
3	KAP	Kavaje	300	15	15	Shrimp	Frozen	
4	Albamar	Durres	120	5	50-60	Mixed species incl. cuttlefish, sea-bream, sea-bass, squid, mullet, hake	Fresh fish	Chill room Ice machine 2 boats
5	Aulona-Peshk	Vlore	80	5	60	Mixed species incl. cuttlefish, sea-bream, sea-bass, squid, mullet, hake	Fresh fish	Chill room Ice machine
6	Pesca Adriatik	Vlore	110	6	130	Mixed species incl. cuttlefish, sea-bream, sea-bass, squid, mullet, hake	Fresh fish	Chill room Ice machine
7	Sangiovani	Lezhe	-	-	-	Mixed species incl. cuttlefish, sea-bream, sea-bass, squid, mullet, hake	Fresh fish	Chill room Ice machine
8	Italpeshk	Durres	108	3	-	-	-	-
9	Peshk Karavasta	Lushnje	-	-	-	-	-	-
10	Toma	Lezhe	100	6	156	Mixed species incl. Hake, cuttlefish, squid, mullet, shrimp	Fresh/Frozen fish	Chill room Cold store
11	Ihtisara	Sarande	150	3	50	Mixed species incl. Hake, cuttlefish, squid, mullet, shrimp	Fresh fish	Chill room

Cont. Table 2.1

EU Approval No.	Name	Town	Processing Area (m ²)	No. Employed	Production (MT p.a.)	Species	Products	Main Equipment
12	Limjon Peska	Sarande	80	4	75	Mixed species incl. Hake, cuttlefish, squid, mullet, shrimp	Fresh fish	Chill room 3 boats
13	Acquario-Sali Peshk	Vlore	110	5	100	Mixed species incl. Hake, cuttlefish, squid, mullet, shrimp	Fresh fish	-
14	N. Peshkimi	Shkoder	-	-	-	-	-	-
15	Adriapeshk	Durres	120	5	50-60	Mixed species incl. cuttlefish, sea-bream, sea-bass, squid, mullet, hake	Fresh fish	Chill room Ice machine 2 boats
16	Goga-Shengjn	Lezhe	120	5	215	Mixed species incl. cuttlefish, sea-bream, sea-bass, squid, mullet, hake	Fresh fish	Chill room
17	Rayk	Durres	-	-	-	-	-	-
18	Llajo	Saranda	90	4	75	Mixed species incl. Hake, cuttlefish, squid, mullet, shrimp	Fresh fish	Chill room 1 boat
19	Fridi	Durres	120	5	50-60	Mixed species incl. cuttlefish, seabream, seabass, squid, mullet	Fresh fish	Chill room Ice machine 2 boats
20	Albit Company	Lezhe	150	5	200	Mixed species incl. Hake, cuttlefish, squid, mullet, shrimp	Fresh fish	Chill room Cold store
21	Zhaku	Butrinti	190	9	50	Mussels	Live mussels	Chill room Ice machine
22	Dental Shengjin	Lezhe	150	7	236	-	Fresh fish	Chill room
23	Tekos Dvoran	Korce	-	-	-	-	-	-

Cont. Table 2.1

EU Approval No.	Name	Town	Processing Area (m ²)	No. Employed	Production (MT p.a.)	Species	Products	Main Equipment
24	Aleksandros	Sarande	-	-	-	-	-	-
25	Inca Lezhe	Lezhe	-	-	-	-	-	-
26	Inktioa Dria	Durres	-	-	-	-	-	-
27	Rozafa	Lezhe	600	12	514	Mixed species incl. cuttlefish, sea-bream, sea-bass, squid, mullet	Fresh fish	Chill room Cold store
28	Poseidon	Lezhe	3000	149	480	Anchovies (salted)	Canned, bottled	Canning, bottling (not sterilised) Cold store
29	Adria Mare	Durres	-	-	-	-	-	-
30	Mare Adriatik	Lezhe	300	35	80	Mixed species incl. cuttlefish, sea-bream, sea-bass, squid, mullet	Fresh fish	Chill room Ice machine
31	Adriatik	Lezhe	-	-	-	-	-	-
32	Eurofish	Lezhe	2000	200	520	Anchovies (salted)	Canned, bottled	Canning, bottling (not sterilised) Cold store
33	Alxiar	Vlore	-	-	-	-	-	-
34	Jon Impex	Vlore	110	6 (+4 temporary)	100	Mixed species incl. Hake, cuttlefish, squid, mullet, shrimp	Fresh/frozen fish	Cold store Chill room

NOTE: A dash indicates missing information and the FD will add this data as it becomes available.

PART III

SECTION I

OBJECTIVES AND TOOLS

The Fisheries Management Plan aims to set policy priorities and establishes the framework for interventions in order:

1. to contribute at a sustainable balance between fisheries resources and fishing effort,
2. to increase the competitiveness of structures and the development of viable enterprises in the industry,
3. to improve fisheries and aquaculture value added products and revitalise areas dependent on them.

The previous analysis allowed to consider strengths and weaknesses of each sector of the industry, which are of great importance for the drawing of a sound fisheries and aquaculture policy in Albania.

In the following, objectives and tools will be identified within each sector Action Plan coherently with the strategy of the Fishery Management Plan and priorities will be set in order to increase the efficiency of the public intervention.

Within each Action Plan priorities are set by their position in the list of actions.

1. MARINE FISHERIES ACTION PLAN

1.1 Fleet renewal and modernisation of fishing vessels

The main feature of Albanian fleet is the obsolescence of vessels both in terms of structure and technology with scarce-to-non-existent levels of investment for modernisation.

The largest part of the fleet is not suitable for fishing out of three / five miles, thus exploitation is concentrated on coastal fishing involving a strong pressure on juveniles.

The renewal of the fleet will be therefore finalised to increase the fleet capacity in order allow a larger distance fishing and the development of the small pelagic species which are, for the time being, under exploited. In the following, fleet priorities are set, depending on the state of resources and their sustainability.

A. *Purse seine fleet*

In order to fulfil internal demand exerted by the existing processing industry and by export. it is needed to allow the re development of this segment of the fleet, either by modernising the on going vessels and by supporting the construction of new vessels. It is considered that 10/15 vessels, falling in the range 15/30 tsl, will be able to meet demand.

B. Modernisation of non trawler fleet under 12 mt

The development of a small scale fishery is strategic from a social and economic perspective. In particular, considering the incidence of fuel cost and the scarcity of financial means available to fishermen for the building of new vessels, the renewal of this fleet segment constitutes a priority. In fact, since it would make more affordable and economically sustainable the activity, it would also avoid an heavy impact on biologic resources given the gears selectivity used by this fleet segment.

C. Trawlers

Actually, the trawling fleet is composed by 38 vessels all of them old, inefficient and unsafe. From a technical and economic point of view it is considered as non efficient to carry out a modernisation policy of the existing vessels. It would show more efficient to pursue a strategic objective based on the gradual complete renewal of the fleet by 25 tsl new vessels whose technical characteristics are more suitable for Albanian fisheries. Of course, the implementation of this priority requires the existence of port facilities which would allow the maintenance of these vessels.

1.2 Accompanying measures in the marine fisheries**A. Implementing EU hygiene requirements for shell-fisheries development**

As previously reported, the commercial fishery for bivalve molluscs, of which the principal species is Clam (*Venus chione*), was closed by the Ministry of Agriculture and Fisheries in June 1991 because of severe depletion of the resources and closure of the export markets as the product failed to satisfy European Union inspection requirements.

At the moment, the design and application of water monitoring system to improve and control quality, traceability, health conditions, statistical instruments and environmental impact are in the process to be implemented aiming to satisfy EU requirements and allowing to re-open such a fisheries. It is of major importance that this action will be maintained in future in order to guarantee the continuity of the molluscs fisheries.

In the meanwhile licence limitation on the number of authorised vessels and the ban on hydraulic dredges should be maintained in order to avoid the possibility of an unsustainable fishing pressure on stocks.

B. Monitoring and adjustment of fishing effort

The need to relate harvesting and processing capacity with estimated sustainable levels of biological resource implies constant monitoring of fishing effort in order to assess the impacts of fishing on different stocks and to address interim management measures. In this framework Licence System will be maintained and the vessel register will be annually updated ensuring that only fishing operations allowed by FD are carried out.

C. Implementing fisheries statistical services

The need to implement an on-going statistical monitoring system is required in order to set up a statistical and economic information unit. In this way data will be gathered and processed and results would provide indispensable data supporting management, programming and ad hoc intervention measures.

Following the implementation of the statistics service within the FD, it will be possible to produce regular reports providing the basis for resource management planning, economic policy and provision of information to other government departments, industry, non-governmental institutions such as universities or others technical assistance agencies and the public.

D. Supporting Fishery Association

Modernisation of the whole industry requires the development and strengthening of producer's association. In this respect, other Countries in the Mediterranean have experienced the importance of having strong associations, often co-operating with national public administration in the implementation of fisheries policies.

Examples of possible activities carried out with the participation of producers' association can be found in the management of micro credit schemes, fishing effort limitations, training of associates, increasing compliance with the national rules, marketing and concentration of produce, realisation of common facilities for maintenance and trade and much more.

The importance of producers association is also to be considered in the light of their contribution to the functioning of Committees foreseen by the National Law; it is a fact that stronger the associations are, more valuable would be their contribution.

E. Professional re-qualification and training

Ministry of Agriculture aims to activate professional re-qualification and training programmes. Programmes would take into account the level of general education and the fishing activities to be carried out. The approach the FD will follow will ensure that all those engaged in fishing operations will be able to deal with new technologies and carry out their duties according to the national law. The education and training programmes intend to qualify fishermen on the following topics: safety equipment on board, improvement of sanitary and working conditions, quality, organisation of transmission of know-how on board vessels and on land.

At least 30 courses have been foreseen each year, with the participation of about 20 fishermen each, in such a way that 600 fishermen could be trained.

F. Subsidising the price of fuel

High price of fuel penalises fishing activity and introduce unfair competition. Its incidence on total production cost of Albanian fishermen is up to 70% against the average 48% of other countries' fishermen in the Mediterranean. In this framework the target is to reduce fuel price to 40 lek/liter, as it is everywhere else. The reduction would increase the rate of activity and allow a fair income to be earned by Albanian fishermen. Results of the reduction in fuel price have been showed in the previous pages.

2. INSHORE AND COASTAL LAGOONS FISHERIES ACTION PLAN

The quantity and quality of such environmental sites is well recognised by the Albanian government and also the international community is aware of their importance. As such, the rehabilitation of most of them is by far a priority and also donors have allocated funds to this scope. From a different perspective, it is also true that in many cases foreign investors have shown to be ready to participate in these resource management and exploitation as far as legislative conditions would allow it.

It is also important to recognise that this issue is twofold according to the activities which take place, fishing and aquaculture. Not always the two are carried out by the same subject. In some cases, fishing is bound to licensed or unlicensed fishermen, while aquaculture activities are carried out by economic groups not involved with the former activity. In both cases, productivity will depend on the existence of hydraulic works and decrease of pollution in the basins. Therefore, the first paragraph is related to infra-structural and structural issues, while the second paragraph deals with management issues related, in particular with aquaculture.

2.1 Infra-structural and structural related issues

As shown in the rest of the plan, productivity of inshore and coastal lagoons fisheries in Albania has steeply decreased in recent years. It is of overwhelming importance to intervene on the following fields:

1. Management legislation
2. Sites maintenance and realisation of hydraulic works, need for capture settings
3. Water pollution control.

Restoring ecological equilibrium conditions implies the involvement of legislative, administrative, technical, financial aspects, all of them essential to the drawing of a sound policy.

A. *Adopting a suitable legal and institutional legislative framework*

As matter of fact, today legislation framework is unclear and ambiguous. There is a frequent overlap of competencies in management of Albanian coastal lagoon. The legal and institutional framework has to be settled and should reflect an integrated and conservation- oriented management approach to lagoons. It is recognised this is a priority and Albanian government is committed to give a legislative solution to the problem. Property rights, access to the water, duration of rights are some of the main issues to be solved.

B. *Sites maintenance and realisation of hydraulic works, need for capture settings*

In recent years the lack of maintenance works to restore the natural flows of the water has been registered. In most cases, projects exist as to rehabilitate ecological equilibrium and also funding have been allocated to the scope. Together with infrastructures, the restoration or installation of capture settings have been foreseen in most cases. These latter structures are in many case been destroyed and in some other case need important maintenance work.

In many cases delays in the start of projects depend on some confusion about the property of sites and property of equipment which would be installed. Once again, it is the need for a clear legislation which is necessary.

C. *Water pollution control*

Together with the previous issue, pollution is another aspect which has brought inshore and lagoon sites at a low productivity level. As indicated in point B above, there is a need to give rise to large financial resource allocation in order to reduce and, eventually, eliminate source of pollution. Together with the restoration of ecological conditions, there is a number of project directed to introduce means of controlling pollution. Once again, one of the major problem has to be found in the need for a clarification about competencies among different public bodies involved in the management of sites.

2.2 Management and exploitation related issues

FD recognises the need to promote a responsible approach to fishing and aquaculture development in inshore and coastal lagoons. In this respect, FD intends to bring these principles in the Fishery Management Plan and in order to achieve this goal it has been agreed to establish, maintain and develop an appropriate legal framework, which facilitates the development of responsible aquaculture.

In the perspective of promoting responsible development and management of aquaculture, FD will consider as a priority the evaluation of genetic diversity and ecosystem integrity together with aquaculture development in Albania, based on the best scientific information.

As in previous case, it is the lack of suitable credit facilities which limits aquaculture development. In this case also, the setting-up of micro-credit scheme would enable farmers to draw the capital needed to start or develop their activity. Whereas the access to financial bank may result difficult, FD would suggest and support those project realised by donor countries which will foresee financial schemes directed to allow farmers to realise productive investments according to the guidelines which will be issued by the Ministry of Agriculture.

A. *Re-conversion of freshwater farms from the cyprinid species culture to mugilid species culture*

The rehabilitation of the freshwater aquaculture sector is subordinated to the possibility to integrate a part of the industry based on the culture of cyprinid species with mugilid species. The local demand for mugilid species is higher than cyprinids, due to the culinary tradition of the Albanian people. The availability of local farming expertise, existence of the infrastructure and the possibility to contact experts will allow the success of this activity.

B. *Training programme for the development of aquaculture inside coastal lagoon*

In Albania there are 8 main lagoons with a total surface of about 10.000 ha. They constitute an important resource for Albania both from an ecological and economic point of view. The development of "aquaculture inside coastal lagoons" involves the control of the hydraulic circulation and water renewal in lagoons as well as selective fish "seeding". A training program in this domain will be prepared in order to assist Albanian fish farmers and to improve their awareness in according to a responsible fish farming in lagoons.

C. *Promulgation of guidelines for coastal lagoon*

The major constraint to perform coastal lagoon aquaculture remains the legal status of lagoons, that despite numerous approved laws, remains unclear. Due to lack of clear legislation framework there is a frequent overlap of competencies in the field of management of the Albanian coastal lagoon. A concerted action, involving FD, GFDP and NEA, will aim to adopt as soon as possible the suitable legal and institutional framework to achieve the sustainable and integrated use of coastal lagoon resources, taking into account the fragility of coastal lagoon ecosystems and the finite nature of their natural resources, and the needs of coastal

communities. In order to finalise these objectives a document concerning an Albanian policy for organic fish farming (integrated with a protocol of intents) will be elaborated.

D. *To develop environmental and quality principles for extensive aquaculture*

In context of the development of the “aquaculture inside coastal lagoons” and the high demand of export for wild and wild like fish production (sea bass and sea bream), FD aims to promote the procedures of quality ISO 9000 and environmental ISO 14000 integrated system for the fish farming organisation and to promote the organic fish farming principles in the Albanian lagoons in compliance with European Union laws.

E. *Mussel farming rehabilitation*

The rehabilitation of the existing farming facilities in Butrinti lagoon and the resuming of the export for molluscs are fundamental steps for improving mussel farming activity. In this perspective it will be necessary to establish a monitoring system of Albanian coastal waters and respective population of bivalve molluscs. To be eligible for export of mussel in EU, it is mandatory to consolidate the monitoring system according to European requirements. The FD intends to guarantee the categorisation of the waters and the areas of production (A, B, C). These ask for the setting up and strengthening of the checking structures, included the strengthening of the laboratories at a local level (part of which has started to be set up) as well as the strengthening of the co-operation between fishery and veterinary inspectorate.

F. *The establishment of small capacity hatchery for supporting mariculture development*

Mariculture development in Albania would start by focusing on those species that are typically requested in the local market and immediate export market (sea bass and sea bream) and using well established and simple culture techniques. The main developmental constraint for this is the availability of farming technologies and capital to establish commercial operations. FD intends to incentive a pilot project aiming to the establishment of small capacity hatchery according to wild-like semi-intensive criteria, based on the Italian experience implemented in valli. The first step in this direction, will be the approval of a pilot small modular hatchery design that can be replicated in any other lagoon through private funding. The main function of this mini hatchery would be to introduce tested technologies, to train local technicians and to provide adequate hatchery and farm design to interested entrepreneur.

G. *Resources overexploitation*

The large number of fishermen which are usually exploiting biological resources is among the most important causes of depletion of fish stocks in inshore and coastal lagoon fisheries.

Of course, social and economic reasons brought to the actual excessive number of people living on these resources, but it is also true that, given the actual rate of exploitation, it will be difficult to maintain sustainable fisheries in future.

FD is well aware of the importance to safeguard these areas from overexploitation and considered different options in order to restore a compatible fishing activity. Options for avoiding over-fishing will include:

- Controlling the number and the issue of licences enabling fishermen to exploit lagoon fisheries resources,
- Setting and enforcing restrictions on the size and nature of fishing gear and controlling rules will be respected,
- Establishing fishing seasons

- Establishing areas within the lagoon where fishing is prohibited or otherwise restricted.

3. FISHERIES IN INLAND WATERS ACTION PLAN

3.1 Common property resources management

The Fisheries in Inland Water Action Plan gives priority to common property resources management: lake and artificial basin fisheries. Albania has a great number of natural lakes and irrigation basins which, are actually under exploited. In fact, these fisheries suffer the loss of traditional markets, lack expertise management and working capital. In such a situation, the Fishery Directorate is willing to favour the development of a domestic markets for the fresh product and to give economic opportunities to less advantaged rural areas.

To achieve these goals, the FD considers Microcredit Scheme as a useful tool which would allow local fishermen and local population to receive the minimum financial resource needed to implement fishing activity.

A. Promulgation of management guidelines inland fisheries

In order to develop an operative framework allowing a better control and rational utilisation of lakes and artificial basins resources the FD will approve administrative guidelines for protecting the ecosystems and raising the awareness of local authorities and fishermen for a further and more effective future co-ordination and co-operation. This will be done by introducing the traditional licensing scheme in these sites, aiming at eliminating illegal fishing, controlling fishing effort and managing resources.

B. Microcredit scheme for re-stocking of in land water

Respect of management guidelines will prelude the implementation of Micro-credit Scheme and co-operation between local authorities, fishermen and FD inspectors. In fact, Micro-credit has proved itself to be an effective tool for developing less advantaged activities by creating opportunities to have access to financial resources.

In case of rural areas, Micro-credit Scheme will provide funds to activate a large number of people through the involvement of local authorities and fishermen in a re-stocking programme aiming to rehabilitate fisheries activities in lakes and artificial basins.

Among the priorities falling in the Inland Water Action Plan, there it the need to sign an interstate agreement among Albania, Greece and Macedonia. Co-ordination and regulation of the water use will allow to implement a common strategy in protecting the ecosystem. FD intends to establish a network among national research institutes aiming to promote joint research programme.

3.2 Tools

The Fisheries Management Plan, as described so far, is a complex system dealing with the identification of rules able to secure sustainability of resource exploitation together with the creation of a productive system able to fulfil social and economic expectations. In particular, it is meant to secure new employment and wealth in the fishing industry through investments and the implementation of sound management rules. Of course, the whole set of rules requires the maximum of compliance from the producers if the objectives have to be achieved.

While biological resource management rules belong to traditional schemes, overall applied in the Mediterranean, and respond to the FAO Code of Conduct, financial resources and tools needed to facilitate investors to are not easy to clearly identify. As matter of fact, the national budget for fisheries and aquaculture is, by the time being, is not enough to accomplish all the initiatives which have been listed in the previous chapters. The lack of sufficient funding from the Albanian government for fisheries purposes, giving other priorities in the more general economic activity of the Country, calls for the identification of other financial sources, which are available to the government itself and to private investors.

As in many other cases, it is capital aid which is generally understood as adequate for subsidising investments, but in the Albanian case it is believed that the former measure should be put in place together with other financial instruments, such as loans, interest rate reduction and a system of guarantees allowing private investors to get loans at reduced rates. As matter of fact, the general economic conditions of the Country is improving and fisheries does not represent any exception to the rule. Many of the possible initiatives which have been identified could be realised by private investors if only money would be accessible at a reduced interest rate.

As a general rule, it is believed that maximisation of benefits emerging from financial aid will be therefore secured by associating capital aid to the realisation of infrastructure public investment, while private investment should be subsidised through the implementation of credit schemes for interest rate reduction to be put in place together with a guarantee system enabling access to money. Even if this approach cannot be considered as a general rule, the FD will stress any program or project which will allow the principles now stated to be enforced.

Considering the importance of external financial resources for the achievement of the objectives, it has been decided to list all possible donors involved with the fishing industry, associating them with those measures reported in the different Action Plans, which could be potentially carried out on the basis of their mission.

PHARE – SOP (Sector Operative Programme)

The Phare Programme is currently the main channel for the European Union's financial and technical co-operation to those Countries of central and eastern Europe (CEECs). In Albania it is providing funds for a few projects. Among others, the Technical Assistance to Fishery Directorate", the realisation of a fish market in Vlore, and the realisation of 2 slipways are now being carried out and it is now going to implement the Sector Operative Programme (SOP). The SOP 1999 takes into account the recommendations and conclusions of "Fisheries sector study", funded by PHARE in 1996 (PMU contract n. AL93080609), SOP 1997 and 1998. According with these studies, the fishery sector can benefit through the provision of infrastructures and services to be performed by Fishery Directorate.

ADRIAMED

ADRIAMED is a project financed by Italian Ministry of Agriculture and Forestry and managed by FAO. It aims to promote a sustainable development of fishery sector. In such a perspective the associated countries (Albania, Croatia, Italy and Slovenia) set up a network for controlling and regulating fishing effort in the area.

INTERREG II

INTERREG is an European Union Programme. The objective of the new phase of INTERREG is to strengthen economic and social cohesion in the European Union by promoting cross-border, trans-national and interregional co-operation and balanced development of the EU territory. Particular attention will be given to co-operation development across the Adriatic and the Southern Baltic approaching the ***Trans-national co-operation*** for promoting the preservation of the environment and good management of natural resources, in particular water resources.

INTERNATIONAL CO-OPERATION (INCO)

INCO has different objectives and approach to accommodate the specific nature of the problems in different world regions. Albania is included in the category of Central and Eastern European countries which are not candidates for accession now and could utilise funds for activities aiming to solve regional problems within the field of environment and sustainable use of natural resources. In particular, the priorities of the second call will allow the realisation of training actions concerning the 5 Framework Programme.

MEDITS - Mediterranean international trawl survey program

The European Commission has incited to the implementation of a common programme for assessment of Mediterranean fisheries by trawl surveys. The programme aims to support the regulation of Mediterranean fisheries, particularly for the application of the common fishery policy in such area. In particular, the programme is designed to achieve standardised information on the status of biological Mediterranean resources.

PASARP – Programme of Activities in Support of the Albanian and Refugee Population

The programme is based on Italy/Albania/IFAD/UNOPS agreement and it is financed by Italian Ministry of Foreign Affairs. On the basis of socio-economic studies fisheries has been selected as eligible sector for the implementation of micro project, including Micro Credit Schemes.

WORLD BANK FISHERIES DEVELOPMENT PROJECT

The main objectives of the proposed project are to achieve sustainable use of marine resources and increase the household incomes of fishing communities. The proposed project would also support the Government's initiatives to strengthen its capacity in essential public functions such as research, training and regulation in the fishery sector.

To achieve these objectives, the project aims to carry out the following main activities: a) development of regional and national fishermen's associations, b) policy and institutional support, c) promotion of aquaculture development.

MICROCREDIT SCHEME

Among the many different measures which can be undertaken within the previous Programmes, it has to be underlined the importance of the Micro Credit Schemes, (MCS) as one of the most valuable action which could rise sufficient funds for private investors. These schemes could mobilise funds from governments and donors (in particular it is the World Bank which could play an important role), in the form of loans and equity grants and provide these funds to local Micro Credit Institution to finance local fishery project. These MCIs will be autonomous and outside direct control of the government and engaged in retailing loans to the small scale investors which usually have difficulties in getting money from the institutional banking system, either because of high interest rates or the lack of adequate guarantees. The government or a donor agency should provide the necessary funds to establish a special office with the overall function of providing technical support to both loan applicants and bank officers during the appraisal process of individual loan applications. It is important that these loans are easily accessible with interest rates adequately adjusted.

FUNDING PROGRAMME	FINANCIAL INSTITUTION	MEASURES POTENTIALLY FUNDED
PHARE – SOP	European Union	1.2B - Monitoring and adjustment of fishing effort 1.2C - Implementing fisheries statistical services 1.2D - Supporting Fishery Association 2.1B - Sites maintenance and realisation of hydraulic works, need for capture setting
BLUE ACTION NATIONAL PROGRAMME	Albanian Ministry of Agriculture and Food	1.2A - Implementing EU hygiene requirements for shell-fisheries 1.2F - Subsiding the price of fuel 2.1A - Adopting a suitable legal and institutional legislative framework 2.2C - Promulgation of guidelines for coastal lagoon 2.2D - To develop environmental and quality principles for extensive aquaculture 2.2G - Resources overexploitation 3.1A - Promulgation of management guidelines inland fisheries
ADRIAMED	Italian Ministry of Agriculture and Forestry	1.2B - Monitoring and adjustment of fishing effort 1.2C - Implementing biological fishery statistical services
INTERREG III	European Union	1.1A - Fleet renewal: Purse seiner fleet 1.1B - Fleet renewal: Modernisation of non trawler fleet under 12 mt 1.1C - Fleet renewal: Trawlers 2.2E - Mussel farming rehabilitation
INCO	European Union	1.2E - Professional re-qualification and training 2.2B - Training programme for aquaculture inside coastal lagoon
PASARP	Unops	2.1C - Water pollution control 2.2A -Re-conversion of freshwater farms from the cyprinid species culture to mugilid species culture 3.1B - Microcredit scheme for re-stocking of in land waters

MEDITS	European Union	1.2C - Implementing fisheries statistics through stock assessment
WORLD BANK FISHERIES DEVELOPMENT PROJECT	World Bank	<p>1.2C - Implementing biological fishery statistical services</p> <p>1.2E - Professional re-qualification and training</p> <p>2.1B - Sites maintenance and realisation of hydraulic works, need for capture setting</p> <p>2.2A -Re-conversion of freshwater farms from the cyprinid species culture to mugilid species culture</p> <p>2.2B - Training programme for aquaculture inside coastal lagoon</p> <p>2.2D - To develop environmental and quality principles for extensive aquaculture</p> <p>2.2F - Establishment of small capacity hatchery for supporting mariculture development</p>