

DIRECTORATE GENERAL OF FISHERIES
IN COOPERATION WITH
FOOD AND AGRICULTURE ORGANIZATION
OF THE UNITED NATIONS

WORKSHOP ON STRENGTHENING
MARINE FISHERIES DEVELOPMENT
IN INDONESIA

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INSTITUTIONAL STRENGTHENING

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1. BACKGROUND

The main institutions directly involved in the administration, development and management of the fisheries industry in Indonesia are the Directorate General of Fisheries (DGF), Provincial Fisheries Service (Dinas Perikanan Propinsi), and the Central Research Institute for Fisheries (CRIFI). DGF and CRIFI are separate institutions under the Ministry of Agriculture while the Provincial Fisheries Service come under the purview of the Ministry of Home Affairs.

1.1. Role and Function

1.1.1. Directorate General of Fisheries

The Directorate General of Fisheries (DGF) is the agency responsible for the overall planning, development and management of the fisheries industry in the country. In a recent reorganization of the Ministry of Agriculture (Minister of Agriculture Decree No. 796/Kpts/OT.210/12/94), the Directorate General of Fisheries has been restructured. It now has a secretariat and six directorates namely Programme Development, Production, Enterprise and Processing, Resource Management, Infrastructure and Seed Development or Aquaculture (Diagram 1). Apart from the directorates, DGF has fisheries development centres in various fields. These are located in the regions to serve as technical implementation units. The Centre for Development of Marine Fisheries (Balai Pengembangan Penangkapan Ikan/BPPI) in Semarang is the only one for marine fisheries. Fishing ports and special projects are also under the direct responsibility of DGF while the operations of the government owned fisheries companies come under its supervision.

1.1.2. Provincial Fisheries Service

At the provincial level, the administration of the local fisheries industry is under the Governor while in the district (Kabupaten), it is under the Head of the District. These regional offices draw their authority from the Ministry of Home Affairs (Minister of Home Affairs Decree No. 5 of 1980). In general, the main role of the Provincial Fisheries Service (Dinas Perikanan Propinsi) and its branches is to implement the fisheries programmes under the technical guidance of DGF. As such, the organizational structure of the provincial and district fishery services are similar to that of DGF with the exception that there is no section on fishery resource management as depicted in Diagram 2, the Irian Jaya Provincial Fisheries Service.

The main functions of the regional services are dissemination of information and technology, provision of technical back-stopping through extension and the collection of statistics. This is done through the regional offices at provincial, district and sub-district level. They are supported by a network of stations and sub-stations at ground level which serve as the technical implementation or extension units. Another important function of the Provincial Fisheries Service is the issuance of fishing licenses for local fishing vessels up to 30 GT using engine of not more than 90 HP.

Licenses for fishing vessels beyond this range, as well as those operating in the EEZ of Indonesia, are under the jurisdiction of the DGF.

1.1.3. Central Research Institute for Fisheries

The Agency of Agricultural Research and Development (AARD) of the Ministry of Agriculture is the agency responsible for planning, implementing and coordinating agricultural research and development. Fisheries research comes under its purview with the Central Research Institute for Fisheries (CRIFI) as the institution charged with the task. CRIFI has a network of three research institutes. They are the Research Institute for Marine Fisheries (RIMF) in Jakarta, Research Institute for Freshwater Fisheries (RIFF) in Sukamandi and Research Institute for Coastal Fisheries (RICF) in Maros (Diagram 3).

The institute directly involved in marine fisheries development is the Research Institute for Marine Fisheries (RIMF) in Muara Baru, with two installations, one in Ancol and the other in Slipi. Prior to the Minister of Agriculture Decree No. 796/Kpts/OT.210/12/94, RIMF had two other stations namely in Ambon and Semarang carrying out work in oceanic fisheries (Ambon) and pelagic and demersal resources (Semarang). They are now under the Institute for Assessment of Agriculture Technology at the provincial level.

The role of RIMF is to conduct research on marine fisheries biology, oceanography, ecology, fishery resources, fishing technology, post harvest and socio-economics with the objective of providing sound scientific information for development and management. This include generating data and information on fishery resources potential and level of exploitation, fishing technology including vessel and gear design, post harvest technology to improve quality of catch and product, scientific information on the aquatic environment for fishery resource management and the improvement of fishermen's return through entrepreneurship, agribusiness and marketing developments. To carry out its research activities, RIMF has five research groups namely in fisheries biology, fisheries oceanography, gear technology, post harvest, and socio-economic issues. They are supported by an administrative division and two sections in planning and technical services. The structural organization of RIMF is given in (Diagram 4).

The research facilities of RIMF include office buildings, laboratories, libraries and workshops. In addition, RIMF has six research vessels ranging in size from 4 GT to 180 GT. The biggest KM Bawal Putih (180 GT) built in 1974 is for pelagic resource survey; KM Mutiara IV (115 GT) also built in 1974 is for demersal resources and crustacean surveying; KM Sardinella (64 GT) for fishing technology of small pelagic in collaboration with fishermen; KM Penelitian I (20 GT) for aquatic environment and fishing technology study; KM Kerapu (7 GT) and KM Banyar (4 GT) for aquatic environment survey.

The research outputs of CRIFI relating to policy issues are sent to DGF for use in the national planning, development and management of the fisheries industry. Research findings and technologies which require field verification are disseminated to the Institute for Assessment of Agriculture Technology in the provinces for trial and adoption. The research results are also made available to fishermen and the industry as a whole. Scientific work done are written up as articles for publication in the Fisheries Research Journal of Indonesia.

1.2. Manpower

1.2.1. DGF and Provincial Fisheries Service

The total manpower strength of DGF and Provincial Fisheries Service inclusive of their installations is 5,290 personnel. The distributions are 590 in DGF, 2919 in the 27 Provinces comprising 2,068 central government and 851 local government funded staff, 848 in the various fishery harbours, 587 in the development centres and network of stations, 265 seconded to government owned fishing companies and 81 in the various projects (Table 1).

Table 1 : Manpower in Fisheries Institutions

No.	Location	Degrees		Non Degrees		Total
		IV	III	II	I	
1	Directorate General of Fisheries	70	294	215	11	590
2	Development Centres	5	148	345	89	587
3	Projects	3	32	45	1	81
4	Government Owned Company	7	68	189	1	265
5	Fishing Harbour	12	167	616	53	848
6	Provincial Fisheries Service (Central Government)	17	802	1249	0	2068
7	Provincial Fisheries Service (Local Government)	76	351	422	2	851
Total		190	1862	3081	157	5290

Note : I, II, III and IV represent grade of service with IV being the highest grade.

In terms of qualifications, 5 have Ph.D., 31 Master Degrees, 1,389 Bachelor Degrees, 849 Diploma holders, 2,541 High School Graduates, 115 Junior School Graduates, and the balance with lower level education. Of these, 3,665 are considered as technical and 1,625 non-technical staff (Repelita VI, 1994).

Apart from the above, there is a network of agriculture extension workers in the field. In fisheries, there were 4,103 extension workers spread out in the 27 provinces in

1994. About 8% of them have tertiary education (Table 2). The agricultural extension workers, including those in fisheries are now under the Centre for Agriculture Extension, Ministry of Agriculture. Prior to 1994, they were under the DGF. With the new arrangement, the extension workers are now under the control of the Provincial Fisheries Service. They are also expected to expand their scope of work to cover agriculture as a whole, apart from their own specialized fields.

Table 2 : Fisheries Extension Workers (1994)

Province	Degree	Non Degree	Total
DI Aceh	6	87	93
Sumatera Utara	11	102	113
Sumatera Barat	22	142	164
R i a u	10	106	116
J a m b i	6	93	99
Sumatera Selatan	7	192	199
Bengkulu	5	63	68
Lampung	8	55	63
DKI Jakarta	9	14	23
Jawa Barat	6	237	243
Jawa Tengah	27	229	256
DI Yogyakarta	6	63	69
Jawa Timur	16	373	389
B a l i	9	112	121
Nusa Tenggara Barat	19	118	137
Nusa Tenggara Timur	8	185	193
Timor Timur	2	16	18
Kalimantan Barat	11	209	220
Kalimantan Tengah	14	173	187
Kalimantan Selatan	24	105	129
Kalimantan Timur	16	61	77
Sulawesi Utara	20	215	235
Sulawesi Tengah	8	104	112
Sulawesi Tenggara	16	140	156
Sulawesi Selatan	8	271	279
Maluku	13	144	157
Irian Jaya	9	178	187
T o t a l	316	3787	4103

1.2.2. Research Institute For Marine Fisheries

The present (1996) manpower strength of RIMF is 221 comprising 82 established researchers and 7 non-classified ones; 36 established technicians and 11 non-classified ones; 3 established computer operators and 1 non-classified ones; 7 established librarians and 2 non-classified ones; 2 filing clerks; 51 administrative staff and 19 supporting workers (Table 3). In terms of qualifications, 97 (44%) of the staff possess university degrees with 14 having Ph.D., 25 Master Degrees and 58 Bachelor Degrees. The balance is composed of 19 (8%) Diploma holders and 105 (48%) are from lower levels of schooling (Table 4).

Table 3 :
Manpower Strength (1996) Research Institute for Marine Fisheries

No.	Position	Total Number
1	Researchers	82
2	Researchers (Non Classified)	7
3	Librarian	7
4	Librarian (Non Classified)	2
5	Computer operator	3
6	Computer operator (Non Classified)	1
7	Technicians	36
8	Technicians (Non Classified)	11
9	Filing clerks	2
10	Administrative staff	51
11	Support workers	19
Total		221

Table 4 :
**Manpower of Research Institute for Marine Fisheries
by Educational Qualifications**

Location	Level of Qualification							
	S3	S2	S1	SM	SLTA	SLTP	SD	Total
RIMF Muara Baru	9	8	38	9	50	5	6	125
Laboratory Ancol	0	3	7	0	5	1	3	19
Laboratory Slipi	4	14	9	10	15	4	5	61
Demon pond Kamal	1	0	4	0	9	0	2	16
Total	14	25	58	19	79	10	16	221

S3 : Ph.D. S2 : Master Degree S1 : Bachelor Degree
 SM : Diploma SLTA : Senior Vocational School SLTP : Junior Vocational School
 SD : Primary School

1.3. Education and Training

1.3.1. Agency for Agriculture Education and Training

The Agency for Agriculture Education and Training (AAET) of the Ministry of Agriculture, is the agency responsible for human resources development in agriculture including fisheries. The role of AAET is to plan, develop, implement or assist institutions in the implementation and coordination of training in the agriculture sector. The programmes of AAET cover administrative and management training for officers of the lower echelon level, technical training locally or abroad for officers, and extension education cum training for farmers and fishermen in collaboration with related institutions. Training for the top echelon level personnel is by the National Administrative Board (Lembaga Administrasi Negara/LAN) and National Defence Institute.

The implementation of training is usually done by the respective technical implementation units (Unit Pelaksana Teknis/UPT) of AAET, DGF and Provincial Fisheries Service. At the AAET level, there is already a structured fisheries education system. This comprises the Fisheries College (Sekolah Tinggi Perikanan/STP) in Pasar Minggu equivalent to a college level study of 3 to 4 years with degree status; Senior Vocational High School (Sekolah Usaha Perikanan Menengah/SUPM) and Junior Vocational High School (Sekolah Usaha Perikanan Pertama/SUPP) which conduct vocational fisheries courses of 3 years duration at different levels. AAET also conducts shorter training courses at its Fishing Technology Training Centres (Balai Keterampilan Penangkapan Ikan/BKPI) in Belawan, Tegal, Banyuwangi, Ambon, and Bitung.

1.3.2. DGF and Provincial Fisheries Service

At the DGF and Provincial Fisheries Service level, extension training is being provided to both extension staff and fishermen at various levels. They are carried out at the Fishing Technology Development Centre (Balai Pengembangan Penangkapan Ikan/BPPI) in Semarang and the various extension units (Unit Pembinaan Modernisasi Bertahap/UPMB) at the provincial level. Some of these units have their network of stations (Loka) and sub-stations (Panti) at the district (Kabupaten) and sub-district (Kecamatan) level respectively.

1.3.3. Universities

In addition there are some 11 national and private universities providing fisheries education from the diploma to degree level. Some of these institutions such as the Fisheries Faculty of the Bogor Agriculture Institute conduct post graduate courses up to Ph.D. level as well.

2. ISSUES AND CONSTRAINTS

2.1. Organization and Function

2.1.1. Sectoral and Inter Sectoral Level

A number of ministries, agencies and institutions are involved in the administration, development and management of the fisheries industry in Indonesia. At the sectoral level, the three key institutions DGF, Provincial Fisheries Service and CRIFI are separate organizations. While DGF and CRIFI are under the Ministry of Agriculture, the Provincial Fisheries Service come under the Ministry of Home Affairs. Although there is some demarcation of the roles and functions of each, there is a lack of consultation and coordination in the formulation and implementation of fisheries policy and programmes.

At the inter-sectoral level, the scenario is similar. The State Ministry of Research and Technology and Ministry of Industry and Trade exert a strong influence on the issues of fishing vessel and fish processing plants. The Ministry of Defence and Security and Arm Forces Command (NAVY) on the other hand are the lead agencies in fisheries enforcement. Others include the Ministry of Cooperatives which promote fisheries cooperatives; the Directorate General of Sea-Communication which deals with the issuance of sea worthiness certificate, classification of vessels and harbour regulations; and Indonesian Institute of Sciences through its agency, National Institute of Oceanography which does work in marine sciences. Very often, there is a lack of understanding and co-ordination in the discharge of these functions, which have an adverse effect on the activities of the fisheries industry as a whole.

The lack of a clear chain of command not only affects the implementation of programmes and achievement of goals in fisheries, but also gives rise to conflict of interests at sectoral, departmental and institutional level.

2.1.2. Directorate General of Fisheries

Coming down to DGF level, the structural provisions of a secretariat and six directorates with their sub-directorates (Diagram 1) are generally appropriate for it to discharge its responsibility in the planning, development and management of the fisheries industry. The major drawback being the absence of fisheries extension, which is now centralized in the Ministry of Agriculture under the Centre of Agricultural Extension since 1994. This has to some extent diluted extension services to the fisheries sector as there is also a change of extension system from the monovalent to the polyvalent one.

Further, within the DGF itself, there are areas which require strengthening and streamlining in line with the growing development and management needs of the industry. These are the sub-directorates of data and statistics, fisheries resources, fisheries management, industrial fisheries/licensing, fishing harbour, fishing vessel, marketing, post harvest and enforcement.

2.1.2.1. Data and Statistics

The sub-directorate of data and statistics has to be beefed up because it is now in the process of upgrading its scope of work from one oriented towards production statistics to a comprehensive data-base of management information system (SIMKANNAS). Focus will also be given to the collection of data on fisheries in the EEZ. Presently, this is not done on a routine basis. Compilations are made from whatever reports that are provided by fishing companies without checking for accuracy. As a result, there is insufficient reliable data on the fishing activities in the EEZ.

2.1.2.2. Fisheries Resources and Management

The sub-directorates of fisheries resources and management have a major role to play in guiding and regulating the development of the industry on a rational basis. At the moment, the thrust of the management approach is towards maximizing production without much provision for conservation of the resources. The conservation aspect has been neglected largely due to a lack of awareness that the industry has reached a stage where the emphasis on growth should give way to conservation in the interest of sustainability.

2.1.2.3. Industrial Fisheries/Licensing

The sub-directorate of industrial fisheries development which deals with the licensing of fishing in EEZ has several inadequacies. Licensing is also an activity which is subject to influence and pressure. This has given rise to a number of problems. The allocation of access is one. Often, without much interaction with the fisheries resources and management sections, licenses are issued. The capability of the sub-directorate appears limited. It does not seem to have sufficient knowledge of the fisheries being licensed.

As a result, the scrutiny of fishing operations in the EEZ through licensing is weak. The handling of data and collection of fee are still unsatisfactory. This is manifested in the lack of data on the EEZ fisheries and substantial loss of revenue. In this respect, the sub-directorate has yet to fully exercise its authority on license refusal for non-compliance.

A part from the above, the issuance of fishing licenses is a rather long drawn affair involving 13 different agencies and going through some 30 processes to obtain permits ranging from actual fishing to the use of vessel, equipment, manpower etc. DGF is only involved in 2 of the 30 processes.

2.1.2.4. Fishing Harbour

The shortcomings of fishing harbours are in the areas of berth management, onshore facilities, hygiene and environmental awareness. The utilization of the quays are not well controlled. They appear to be used as general quays instead of as offloading

ones. This has given rise to unnecessary congestion and delay in offloading the catches from vessels. Onshore facilities are also lacking. Water for cleaning the auction floors is in short supply, cold rooms are lacking and toilets are insufficient. Most people in the harbour area lack awareness that the fishing port is part of a food processing chain and the importance of hygiene. As such the harbours do not appear to be well maintained as evidenced by rampant pollution of the environment.

2.1.2.5. Fishing Vessel

In general, the staff of the fishing vessels sub-directorate are well-qualified for their work. There are naval architects, marine engineers, fishery engineers and draughtsmen. Their numbers are however small, with a maximum of 2 each. They are responsible for design work, technical assistance, inspections and safety of vessels.

2.1.2.6. Fish Marketing

One of the major constraint of fish marketing in Indonesia is the expedient transport of fresh fish from the sparsely populated production areas in Eastern Indonesia to the densely populated demand centres in Java. The matter is complicated by the findings of the TCP that further expansion of catches would mainly involve the small pelagics, which are of low value. This poses considerable future challenge to the marketing of fish in Indonesia.

2.1.2.7. Post Harvest

The post-harvest handling of fish in Indonesia is generally in a poor state. There is lack of appreciation that once fish is landed, it will start to deteriorate. Hence it needs to be properly handled and preserved in a hygienic manner. As a result, post-harvest losses both in terms of quantity and quality are considerable.

2.1.2.8. Enforcement

Enforcement is one of the weakest link in the present management system. There are two aspects of enforcement. One is in the technical aspects relating to control of resource exploitation and the other is the physical aspects on compliance of laws and regulations.

On both counts, enforcement has been minimal and weak. DGF's efforts in the technical aspects of enforcement in data requirements and vessel marking through licensing are still unsatisfactory. It has yet to fully exercise its authority on refusal to issue or renew a license for non-compliance as its main mechanism to improve enforcement.

Similarly, the enforcement authority, Coordinating Board for Sea Security (BAKORKAMLA) headed by the Navy does not seem to accord high priority on fisheries matters due to constraints in resources such as facilities, equipment and funding. This is further compounded by the lack of understanding between fisheries and the military on jurisdiction in enforcement matters. Many officials in the DGF and

the Provincial Fisheries Service are not clear on the role, procedures, capability, limitation and facilities available for enforcement of the EEZ. On the other hand, the military especially Navy is unsure of licensing procedures, fishing gear, fishing operations and trends in fleet development including deployment. An increasing understanding would facilitate cooperation.

2.1.2.9. Manpower Strength

In terms of manpower strength, DGF has a very good ratio of officers with adequate qualifications. Of the 560 positions accounted for out of 590 in the establishment, some 51% possess degrees, 8% with diplomas and 41% are mostly high school and junior high school graduates (Table 5). With such a relatively high ratio of qualified personnel, the present strength of 590 is generally sufficient for the performance of its role in planning, development and management at the national level. The main weakness however lies in the inadequate grooming of officers for undertaking the complex task of developing and managing the industry. In this respect, fisheries involve a multitude of disciplines ranging from fishery biology to fishing vessel, gear and post-harvest technology. Expertise in the appropriate disciplines are still lacking and need to be built up to enable the knowledgeable and effective performance of duties.

Table 5 : Distribution of Staff IN DGF (1995)

Directorate	Level of Qualification							Total
	S3	S2	S1	DIPL.	HS	JHS	OTHER	
Secretariat	2	5	44	13	94	2	12	172
Programme	0	4	33	5	24	0	2	68
Production	0	0	42	3	21	0	2	68
Enterprise	1	5	35	5	16	0	0	62
Resource Management	0	5	43	6	14	0	0	68
Infrastructure	0	0	39	5	25	1	0	70
Seed Development	0	2	24	6	19	0	1	52
Total	3	21	260	43	213	3	17	560

S3 : Ph.D.

DIPL. : Diploma

Degree : 51 %

S2 : Master Degree

HS : Senior Vocational School

Diploma : 1 %

S1 : Bachelor Degree

JHS : Junior Vocational School

Non Degree : 48 %

2.1.3. Provincial Fisheries Service

2.1.3.1. Organization

The organizational structure at the provincial level generally follows that of DGF with the exception that it still retains the extension section but does not have one on fisheries management. The thrust of Provincial Fisheries Service is thus on increasing production through extension and issuance of fishing licenses. They also collect fisheries data and statistics for compilation by DGF at national level. With the increasing pressure on the fishery resources through increased exploitation, the need to monitor and manage the activities of the industry has become very urgent. This capability has to be built up at the Provincial Fisheries Service level as soon as

possible. The capacity to collect reliable and timely data and statistics at the provincial and district level is still wanting. The personnel involved are not adequately trained to do their job properly.

2.1.3.2. Manpower Strength

The manpower strength of the 27 Provincial Fisheries Service totaled 2,919 comprising 2,068 central government and 851 local government supported staff. In terms of qualifications, 40% of the central government and 50% of the local government staff are degree holders while the remaining are high school and junior high school graduates. In addition, the Provincial Fisheries Service are back-stopped by a network of field extension workers stationed at the Agricultural Extension Centres. There are some 4,103 fishery extension workers in 1,718 Agricultural Extension Centres throughout the country. The majority (92%) of the fishery extension workers have high school qualifications only. Similar to DGF, a large number of the Provincial Fisheries Service personnel are not trained on their job functions. Thus they generally serve as only fishery administrators lacking technical orientation in the process.

2.1.4. Research Institute for Marine Fisheries

2.1.4.1. Organization

In terms of organization, the existing set-up of a RIMF with only 2 installation, all located in Jakarta is far from satisfactory. This has resulted in research activities being unevenly spread out. Large areas of marine waters especially in eastern Indonesia which are important but are not covered. Up to date facilities and equipment are also lacking. Taking the case of research vessels as example, two of the more appropriate vessels KM Bawal Putih I (180 GT) and KM Mutiara IV (115 GT) are more than 20 years old and not functioning well.

2.1.4.2. Manpower Strength

Indonesia has a vast expanse of internal, territorial and EEZ waters amounting to 5.8 million sq.km. In comparison with the large area and amount of work to be covered, a mere total manpower strength of 221 with 82 researchers only is definitely inadequate. There may be others involved such as the Universities, Ministry of Research and Technology and the Research and Development Centre for Oceanography but their roles are insignificant except for the latter. As a result, the research inputs are relatively low and thinly spread out. Research activities are also scattered and there is generally a lack of documentation of previous work.

2.1.4.3. Facilities/Funds

The lack of manpower is further compounded by the shortage of operating funds and facilities. At the moment, the limitation of operating funds constitutes the most serious constraint. This has prevented researchers from the proper implementation of their research programmes. A good example is the case of the research vessels operated by RIMF. The average utilization of the vessels is only 40 days per year.

2.1.5. Education and Training

The foundation for fisheries education and training has already been established in Indonesia covering both formal and informal/extension types. Formal fisheries education is provided by universities, colleges and vocational schools at senior and junior high school level. This is supplemented by an informal extension education and training programme carried out by the technical implementation units (Unit Pelaksana Teknis/UPT) of the institutions concerned.

At the national level, there are the development centres (Balai) while at the provincial level there are the extension and development units with a network of stations (Loka) and sub-station (Panti) at the district and sub-district level respectively. Although the system of fisheries education and training is fairly well established, there are constraints on the provision of quality education.

Churning out numbers is not a problem but producing appropriately trained manpower is. The quality of graduates is affected by the lack of infrastructure facilities, equipment, qualified instructors in sufficient numbers and last but not least operating funds. Due to the lack of facilities such as laboratories, workshops, equipment and tools, the courses tend to be theoretical resulting in the students lacking in practical skills. With the rapid development in fisheries science, the courses will also have to be modified and upgraded in keeping with the innovations and requirements of the industry.

3. RECOMMENDATIONS

3.1. Directorate General of Fisheries

- i) Forge greater co-ordination amongst the ministries and agencies involved by forming a high level National Steering Committee on Fisheries Development and Management. The membership of this Steering Committee should comprise the Ministry of Home Affairs (Provincial Fisheries Service), State Ministry of Research and Technology (fishing vessel), Ministry of Trade and Industry (cold storage and processing facilities), Ministry of Communication (Harbour, classification of vessels and certification of sea worthiness), Ministry of Cooperatives, Arm Forces Command (enforcement), National Institute of Oceanography, Indonesian Fishermen Union (Himpunan Nelayan Seluruh Indonesia/HNSI), Indonesian Fisheries Enterprise Federation (GAPPINDO), and the Ministry of Agriculture including DGF and CRIFI. The chairmanship of the Steering Committee should be the Ministry of Agriculture with the DGF serving as secretariat. The main objective of the Steering Committee is to enlighten the parties involved on the policy, strategies and programmes of the fisheries sector to gain support as well as cooperation in its implementation. This is to eliminate the lack of coordination that is impeding the development and management of the sector.
- ii) Although a high number (51 %) of DGF staff are university graduates, their education in fisheries is general in nature. With rapid development of the industry and its increasing complexities, they have to be upgraded in their knowledge and skill to meet the new demands of developing and managing the industry based on sound information. Presently the percentage of staff receiving in-service training is still low. Only 4% of the staff have post graduate fisheries qualifications. The in-service training programme has to be stepped up. In this regard, the personnel division of DGF has drawn up an elaborate programme in Repelita VI for manpower training but unfortunately this is not given priority. Some consideration needs to be accorded to strengthening the capability of DGF particularly in:
 - (a) Upgrading of the fisheries statistics and implementing the proposed National Fisheries Management Information System by deploying more staff with computer science qualifications to the sub-directorate and providing them with the training to operate and maintain the integrated data base system developed.
 - (b) Enhancing resource analysis, management and conservation by training the staff involved in the principles, techniques and methodology applied in the field to improve their knowledge and skill for enhanced performance. Conducting study tours to areas with effective fisheries management as well as those with disaster. De-centralizing and increasing the management staff at the field/provincial level.

- (c) Broadening the knowledge of key staff involved in licensing by attending short courses in fisheries management, attachment to an operational and effective licensing unit abroad on control of fishing effort and computerizing the work of the sub-directorate. In addition, reducing the bureaucracy of licensing by adopting a one-stop agency approach. DGF would be the best lead agency for this as it is a fisheries matter.
- (d) Improving harbour design and management by sending staff involved for training overseas in topics such as management techniques, environmental engineering, waste disposal and water supply. Providing local training to harbour master and health inspectors to implement the enforcement of laws in the fields.
- (e) Conducting marketing work focussed on the inter-island trade of low price small pelagics which are plentiful. Providing training in marketing and distribution analysis, marketing research and market information system.
- (f) Enhancing the capacity of the fishing vessel section by increasing the relatively small number of technical staff, who have to oversee one of the largest fleets of fishing vessels in the world.
- (g) Improving post harvest practices by having a nation-wide extension programme directed at the fishermen, extension workers and those connected with the industry on the importance and need to maximize return.
- (h) Compiling a fisheries enforcement profile to facilitate understanding and cooperation between fisheries and enforcement agencies.

3.2. Provincial Fisheries Service

- (i) Establish a fishery management section in the organization structure of the Provincial Fisheries Service to complement that of DGF and implement measures developed. The Provincial Fisheries Service can also serve as the supervision arm of DGF for overseeing the port-related activities of the industrial fleet licensed for operation in the respective provinces. This can be effected through the delegation of power by DGF to the Provincial Fisheries Service. At the moment, there is a gap in this area as DGF has no physical presence in some locations and it would be too costly to establish one.
- (ii) The collection of fisheries statistics and data is done at the provincial level. As the reliability and accuracy of fisheries statistics are much dependent on the field staff, they should be properly trained to carry out the task and supervised. Adequate funds should be provided to enable the field staff to go to fishing centres to collect data. Equipment such as calculators and computers should also be provided to facilitate processing and storage of data collected.
- (iii) Fisheries extension workers have a key role to play in the sustainable development and management of the fisheries industry. They are the agents to bring about changes in the attitude, knowledge, skills and/or behaviour of the fishermen. This would require a more concerted training programme for extension workers to continuously upgrade their knowledge and skills in the

production, post harvest, marketing and management aspects so that they can be more effective. Further, the change in the grouping of extension workers by commodity or monovalent approach to a multi or polyvalent one encompassing the whole field of agriculture is a setback to fisheries because of its high demands. The interests of the fisheries sector would be better served to retain the previous system.

3.3. Research Institute for Marine Fisheries

- (i) Increase the allocation for fisheries research. One way is to set aside a portion of the license fee collected for it. The Minister of Agriculture Decree No. 816 of 1990 provides for the license fees to be used for fisheries development. This will enable the researchers to carry out more research activities and make better use of the research vessels for resource surveys.
- (ii) In view of the comparatively small budget available for research and the large number of parties involved, it would be prudent to coordinate research activities. This would not only avoid duplication of efforts but also ensure that they are complementary. In this way, the limited research funds will be more efficiently utilized. The AARD with CRIFI as the secretariat and others involved particularly DGF and the universities as members would constitute an effective platform for a Fisheries Research Coordinating Committee. The main task of the Committee would be to establish research priorities in line with the needs of fisheries managers and the industry as well as to ensure collaboration in its implementation.
- (iii) Upgrade the capability of the researchers in line with the increasing complexities and demand of fisheries science. An intensified post-graduate or applied training programme would boost the much needed category of trained scientists to serve the managers and industry better. In addition, as the pool of researchers is rather small, there is a need to increase the number. This should be done on a gradual basis with matching increase in research funds to ensure optimum utilization of manpower.
- (iv) The present organizational framework of RIMF has to be expanded. Establish a network of research field stations located in important fishing areas to conduct studies and collect data for a more accurate assessment of the fisheries to avoid over exploitation.

3.4. Education and Training

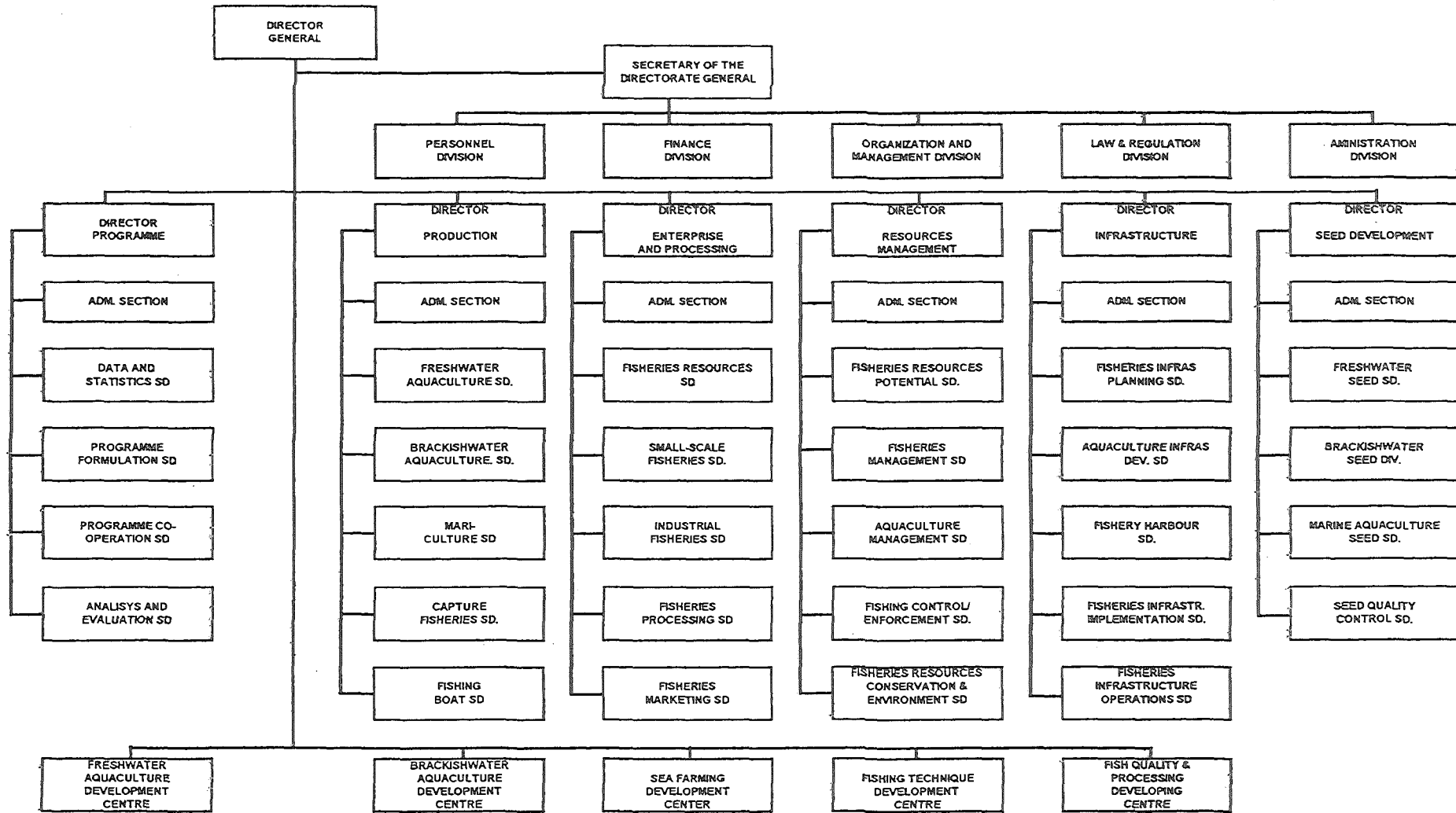
- (i) Refurbish the network of development centres, technical implementation units and their stations with the necessary infrastructure facilities, equipment, and tools to enable the conduct of a more practical oriented training programme.
- (ii) Upgrade the knowledge and skill of the existing instructors to enable them to be more effective.
- (iii) Allocate sufficient funds for the proper conduct of training courses.

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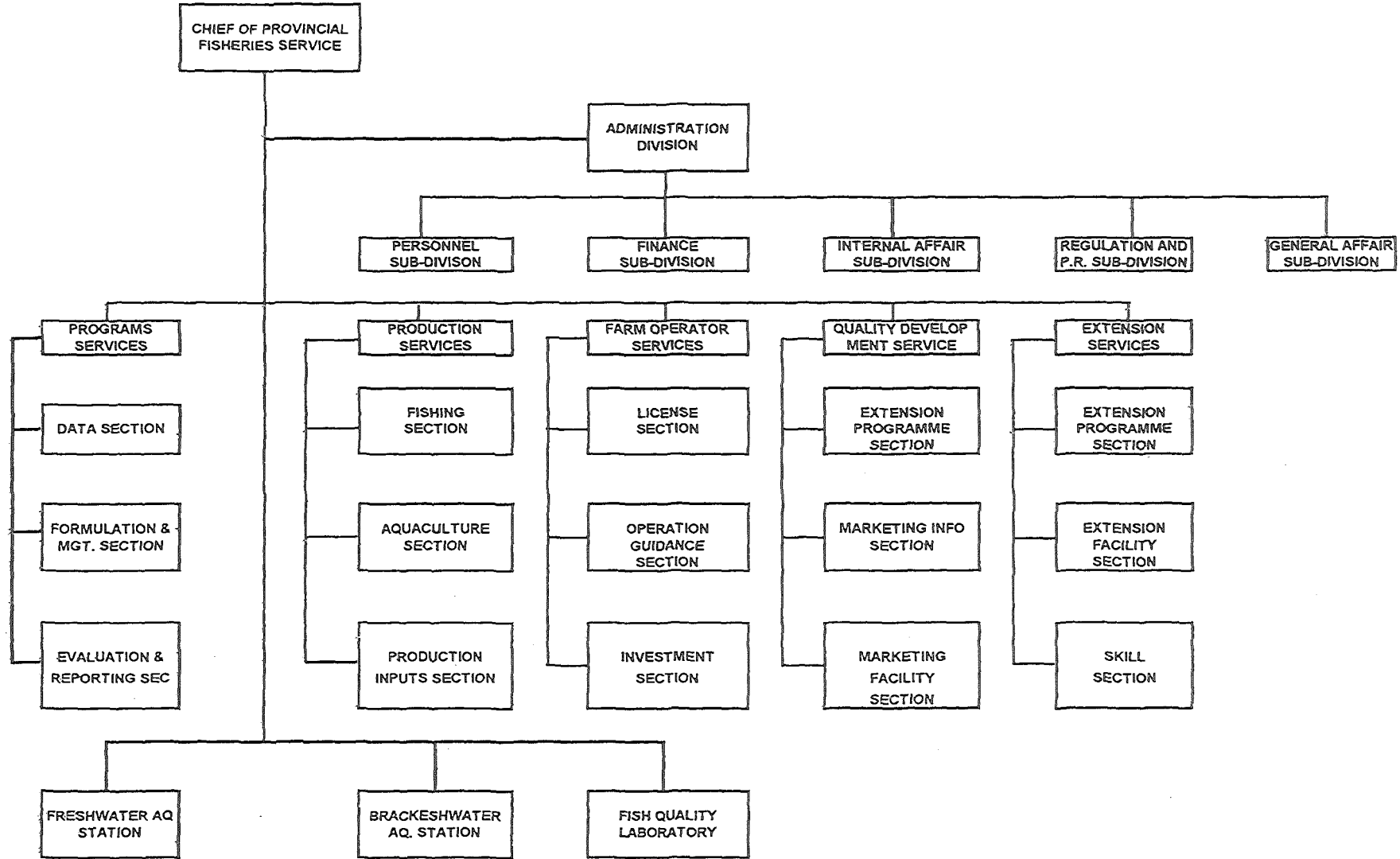
ORGANIZATION CHART DIRECTORATE GENERAL FISHERIES

Diagram : 1

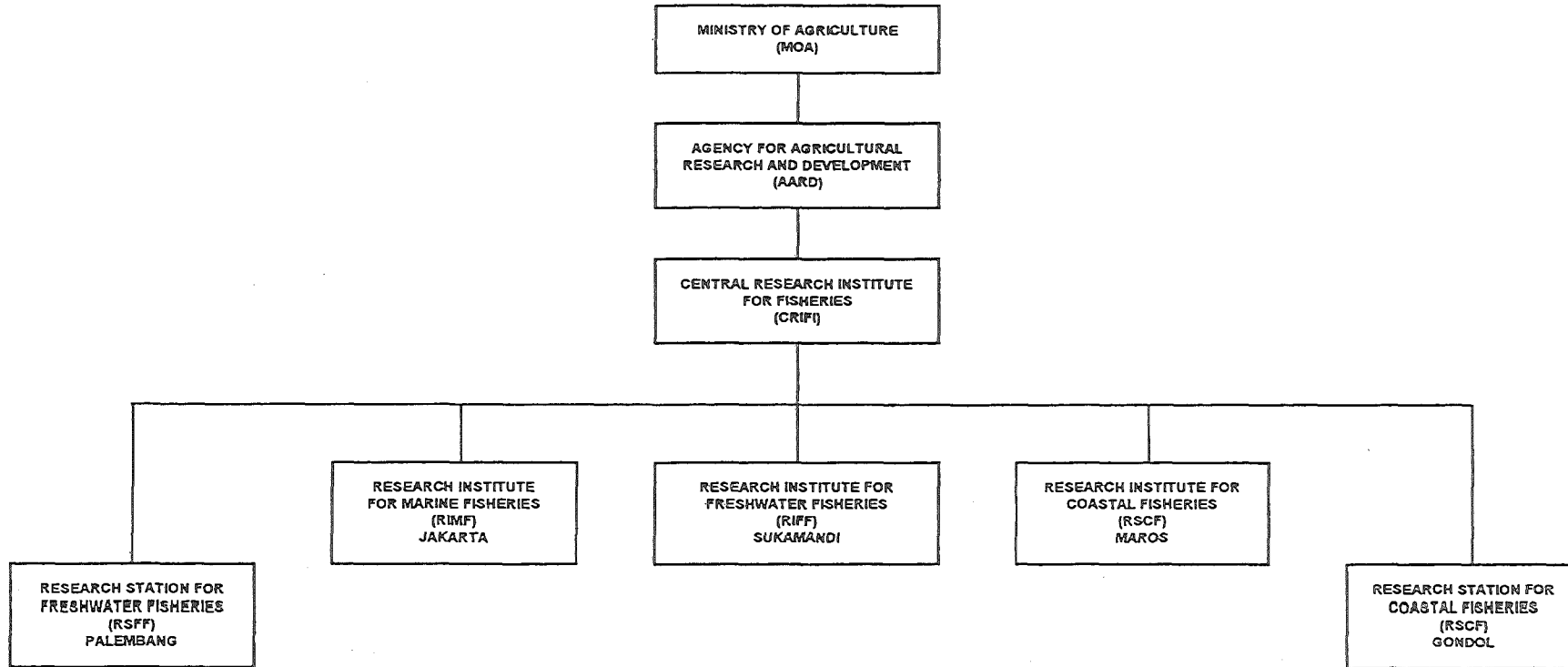


ORGANIZATION CHART
 PROVINCIAL FISHERIES SERVICE, IRIAN JAYA

Diagram : 2



ORGANIZATION CHART
CENTRAL RESEARCH INSTITUTE FOR FISHERIES



ORGANIZATION CHART
RESEARCH INSTITUTE FOR MARINE FISHERIES

DIAGRAM : 4

