2. The Administration of Fisheries Management[1]

2.1 Introduction

It is rare that those with a background in fisheries, either as biologists, local area managers or economists, will have had formal training in public administration, though in a real sense, in managing a fishery, that is what they undertake. This note is does not pretend to offer a complete, but condensed, course in public administration. Rather it attempts to offer some insights into operational methods that may enhance the effectiveness of your fisheries department in achieving its objectives.

These notes should not be the end of a manager's development and reading in this regard. It is hoped that the presentation will also assist the smaller operational unit, and even individuals, in ensuring that they have a good idea as to how their time and other resources are being spent.

2.2 Elements of a Fisheries System

From an administrative perspective, the elements of an effective management system can be taken as comprising:

i. **Fisheries Strategic Planning**, which creates the management institutions and their support, including the legislation for all elements of the system. It defines the objectives and strategies of management. It also establishes the policy and programme parameters within which the fisheries business will be conducted. This includes the development of legislation and regulations, the creation and support of management institutions, and the objectives and strategies to be applied in fishery management plans. It is responsible for consulting with stakeholders to arrive at the rules for governance, and is accountable to all stakeholders for the delivery of the management objectives.

ii. **Annual Planning - Fishery Planning and Partnership Negotiation.** This involves preparation of the annual harvest plans including details of the regulatory package. And it supports the development of seasonal harvesting plans for each fishery. A plan

[1] Most of this section is based on material developed by colleagues at the Department of Fisheries and Oceans, Maritime Region, Canada notably, Leslie Burke.

can apply to one or more stocks and the licence-holding fishermen who have access to it. The plan defines catch quotas (be species, fish stock, etc.), quantities, seasons, fishing areas, input controls (number of traps, dimensions of gear and fishing vessels, etc.), reporting requirements and other parameters that govern the harvest. Partnership agreements made pursuant to a management plan would describe the responsibilities of the participating fishermen and a Department of Fisheries in carrying out the plan.

iii. **Fishery Business Resource and Analysis**, which provides the strategic and annual planning processes with advice and information on all aspects of the economic, social and business issues relevant to the fishery. This should also provides timely analysis of the viability of fishery enterprises and analysis and advice on all aspects of the economic, social and business climate both domestic and abroad, which could affect the fisheries at the strategic or fishery-specific level.

iv. **Resource Analysis**, which undertakes the biological stock assessment and research on the affects of fishing. It involves research on marine resources and their ecosystems so as to develop an understanding of the dynamics of ecosystem operation and methods to assess fisheries resources. It should provide regular evaluations of the status of marine resources (stocks) and assessments of the impact on resources of various fisheries management and conservation measures.

v. **Service Delivery**, which provides ongoing monitoring of the costs and functioning of the management system(s). It also supports the procurement, deployment, management, and control of the human, financial, transport, information technology, communication facilities and other material resources required for the fisheries business service functions.

vi. **Catch and Effort Monitoring**, which provides timely and accurate data related to the use of fishing entitlements as part of Annual Resource Management (or Operational) Plan.

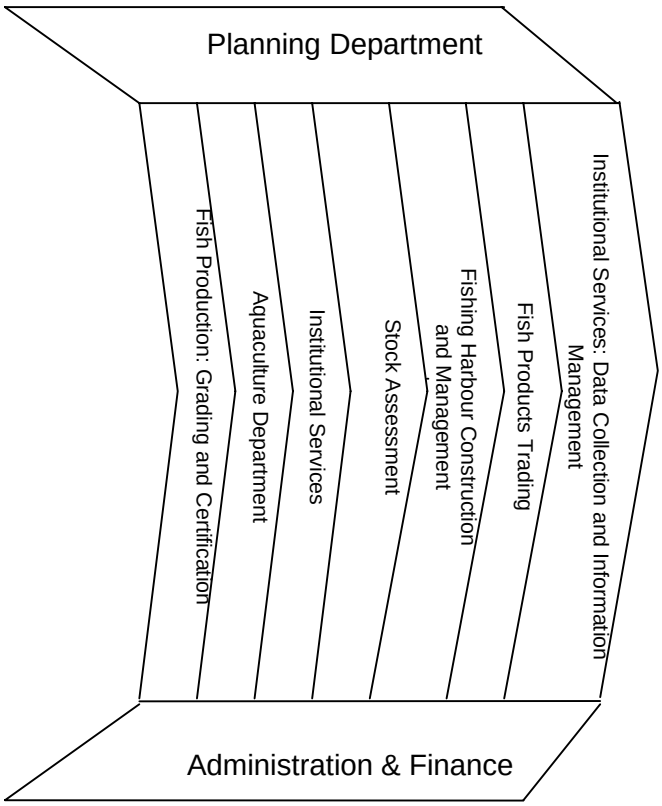
vii. **Administration of Fishing Entitlements**, which involves distribution of licences and co-ordinates and administers fishing entitlements such as Enterprise Entitlements, Individual Transferable Quota (ITQs), Community Quotas, etc. It also supports the

needs of fishermen and vessel owners to register and be licensed for entitlements to fish and to receive fishing rights or allocations in accordance with seasonal harvesting plans. This includes transfers of those rights or entitlements. This administration handles any resulting revocation or suspension of entitlements.

viii. Protection and Enforcement, which is responsible for monitoring compliance with the regulations. This function protects the fishery resource and promotes conservation by monitoring compliance with marine and inland fishery legislation and fisheries management plans. And it ensures that necessary action is taken against violators.

Figure 1 shows the interrelationships between the elements of the various fisheries services functions.

Figure 1
Organizational View of a Generalized Department of Fisheries



Services	Clients
Resource Management	Fishing Industry
Information management	Government Industry public
Resource Management	Inland Fishers
Site Approval Support	Fish Farmers
Ports, Roads, Water, Ice	Harvesting Sector Processors Shippers
Courses / training	Fishermen Plant Workers Ministry staff
Institution facilities	Department staff Public?
Product certification	Fishers Processor Farmers

This presentation will deal with items (iii) and (iv), Business Analysis and Service Delivery. This is not that the other elements of the process are unimportant - clearly they are - but considerations of these two issues are, in my experience, the most likely to be neglected, or at least under-emphasized in a fisheries department.

2.3 What is Business Analysis?

No doubt, there are as many definitions of what *business analysis* is as there are schools of business administration. One is offered here, but readers should not hesitate to adapt this approach to their needs, or adopt one they consider superior for their circumstances. It will be enough if this section introduces the concepts and provides the incentive for those interested to research further the various relevant approaches.

Fisheries departments, no matter their size, often tend to be multi-purpose and thus have multiple objectives; and they often are geographically-dispersed enterprises. As such, it usually essential that they establish formal organizational structures to ensure they achieve their mandated objectives. Within their structure, financial (i.e. budget allocations) and human resources (i.e. people) are assigned along organizational lines and responsibilities are delegated so that organizational goals[2] are achieved. Most organizations strictly control these resources and track their use along organizational lines. This enables accountability for results from any project or task to be traced to a particular department or manager. Figure 2 shows a stylized Organizational View of a fictitious fisheries department indicating the services that are provided and who might receive them. The common service departments, whose role is to serve the entire organization, are depicted horizontally. The programme departments, which control most spending on a daily basis, and which are charged with implementing projects or programs, are shown vertically.

Accountability for the overall results rests at the most senior management level, which must co-ordinate the efforts of different organizational units. Management must ultimately ensure that the resources employed by the organization are used efficiently[3] and effectively to produce services or products of sufficient value so that the enterprise will survive.

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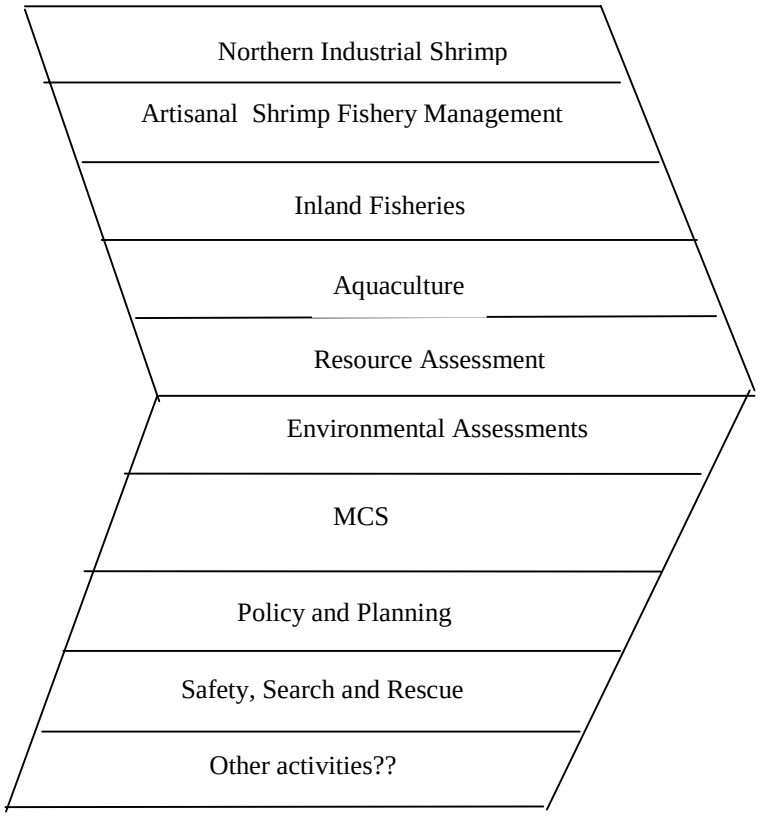
[2] The terms *goal* and *objective* are often used interchangeable. But some management analysts use the distinction that an *objective* applies in general while a *goal* implies a specific level of quantitative achievement. For example, the *objective* of a fisheries department might be to maximize the sustainable yield of a fishery. Its *goal* for 1999-2004 may be sustainable harvests of 2000t/yr.

[3] Functions that are efficient produce the desired result with the least amount of resources necessary; functions that are effective ***achieve*** the result that were desired or intended. Thus, ideally, activities should be effective (achieve the desired

Figure 2
Business Line View



Services	Clients
Resource Management	Companies
Product Certification	Companies Exporters
Resource Management	Inland Fisheries
Site approval	Aquaculture
Courses	Industry Department Staff
Products	Consumers
MCS	Government/ Industry

A *Business Line perspective* of an enterprise can be used in a number of ways.

Managers use strategic[4] and operational plans as co-ordination tools. They also employ committees, multi-disciplinary teams, and other techniques that foster co-operation and teamwork across organizational lines. One way to approach the improvement of management is to consider the “enterprise”(or government department) from the perspective of its services and its products and its “clients" or "customers” these outputs are intended to satisfy.

A Business Function Analysis requires that the different or constituent activities of a department be identified. Note that in doing this, the number of different activities may be more, or less, that the organizational units that exist within a department – because “Business Lines” need not correspond to existing organizational units. This is because several

result) and efficient (i.e. use the least amount of resources to do so.)

[4] 'Strategy' or 'strategic plans' focus on planning at the broad scale or top level objectives. Operational plans (or tactics) are the *means* by which strategic plans are achieved. Both are essential elements of successful management planning.

departments may undertake the same activity (for example, running training programmes, collecting data and maintaining information data-bases); and single departmental units may undertake many different functional activities. Each activity is often referred to as a business line and business line analysis usually cuts across the traditional organizational lines of a fisheries department. This type of analysis requires that the analytical focus be placed on the purposes of the enterprise, i.e. its services and clients, not its existing structure.

- It helps clarify and refine the products and services of the organization in relation to the clients or customers who receive them;

- It provides a tool that allows a department's managers to identify and evaluate the full costs of delivering each Business Line. This is an important factor in determining the effectiveness of public sector expenditures.

- It identifies critical co-ordination interfaces (i.e. those parts of the organization that deal with other parts of the organization or the clients – i.e. those who receive the department of fisheries' services) and which must be maintained within the enterprise across the formal organizational structure to deliver the Business Line outputs. This may or may not follow the formal lines of the organization's structure.

Such Business Line analyses can be viewed in a hierarchical manner. For example, within the business line of training, those doing the training may consider that part of their activities are spent doing research into developing more effective means of teaching with another part of their activities directed towards the activity of raising revenues if they believe that the products they develop can be sold to external users and thus be considered as a revenue-raising activity. What is important is that an appropriate scale and structure is chosen for the analysis that is being undertaken.

A manager may choose to undertake a business line analysis of two regions within his organization to enable a comparison as to how different managers are allocating their resources. For example, one manager may be opting for a centralized method of fisheries control with a heavy emphasis on MCS activities to ensure compliance with the fisheries regulations. In this case much of his budget may used on paying for marine patrol ship time and expenses such as fuel oil and crew's overtime. Another manager may be trying an

approach in which responsibility for enforcement is devolved to the fishermen. In this case, his budget may show more expenses for meetings, educational materials and travel for staff to attend co-management meetings.

The Business Line analysis can be extended to the development of models of the activities that must be performed by the organization to deliver each line. Figure 3 shows a generalized model indicating the relationships between the different business lines. The major elements in such a model have already been introduced in Section 2.2, which described the elements of a fisheries system.

2.4 Service Delivery

2.4.1 Why it Should be Important

When an auditor or analyst approaches the task of relating department expenditures to programme activity, he too undertakes a Business Line Analysis. This is the complement to what the manager should do in his approach to looking at how his department (or section) functions. Analysis of *Service Delivery* starts with identifying who are the clients of the department and what are the services that the fisheries department must provide then. Clearly, if there is some confusion as to who the department should service, or conversely, who is entitled to services, resources may be wasted, or there may be a programme failure through not providing clients with that which the department's mandate requires.

Ultimately, a department of fisheries can be perceived as an organization that exists to provide services to its clients. Taken from this perspective, having a clear understanding of what are appropriate *services* and who its intended *clients* are, is central to effective programme functioning. However, such services are not invariant – many services that were provided by governments in the past have become ‘victims’ of changed politic service policies. The private sector is now commonly expected to provide many activities, such as fish product/quality development, marketing and gear design and evaluation. Thus any business line analysis must be within the context of existing government policy regarding responsibility for delivery of services.

2.4.2 Characteristic Clients and Services Required

Conventionally, departments have a variety of clients that include:

- other sections or units within the fisheries department

- other government departments and institutions (trade, statistics, public health, employment, education, international affairs, etc.)

- those directly involved in the fishing business (harvesting, processing, trade) and

- the public at large including, perhaps, relevant organizations which usually include several NGOs.

The services that are sought by a department's clients may differ considerable. Who should receive services from a department of fisheries will depend on national policy. As noted, in the past, the fisheries departments of many western countries had mandates not only to undertake stock assessment and provide management advice, but were involved in basic research such as oceanography, market development and product promotion, fish processing and trading, vessel and gear design, public education. In many eastern countries, departments of fisheries were also involved in commercial fishing operations and fish trading as well as the provision of shore-based fisheries infrastructure.

2.4.3 What Services Should be Provided?

Many countries have been through recent periods of programme re-evaluation and restructuring under the banner of downsizing based on, or driven by, the view, that many services traditionally provided by government can be more effectively provided by the 'market'. A common response has been that government should not attempt, or undertake, activities that can be done by the commercial sector. There is an additional reason for implementing such a policy to that of (blind?) faith that market approaches are more efficient. It is rare that when government does intervene in some commercial activity related to fisheries that there is no private activity in that sector. Given the usual absence of a strict need for commercial accountability within governments, where the losses incurred in one service activity can be cross-funded, or subsidized from another department, government activity can doom any private initiative to failure - a consequence which is prejudicial to what is occasionally called the "*level playing field*".

2.4.4 Alternate Developments in Service Delivery

Some departments in different countries have adopted a view that even functions that were once seen as intrinsically public services[5] can be more efficiently provided by commercial organizations. In these countries, research organizations that have traditionally had the mandate to provide services such as stock assessment have been 'corporatized'; they are then required to show a return on capital, i.e. a profit, and the work they do may be open to tender by other organizations. In the case of New Zealand, contracts have been won by government organizations in Australia to undertake stock assessment work done in the past by the government department. The Fisheries Laboratory in Lowestoft, a centre where much of the pioneering work on fish population dynamics was undertaken, is another institution that now must achieve full cost recovery from the sectors, public or private, to whom services are supplied.

These changes have revolutionized many other aspects of the fisheries management process and a description of these changes is more appropriately dealt with elsewhere. But they have focused attention on the concept of value for money, who pays for what and a further concept of who pays – says.

2.5 Budget Allocation

2.5.1 Business Line Allocations

The allocating of an organization's budget to its Business Lines through cost accounting is a common practice in the private sector as each service or product is expected to make a contribution to the overall profitability of the organization. Similar cost accounting is just as useful to public enterprises or departments.

Table 1 shows some comparative analysis of costs in managing three fisheries in the Maritimes Region of Canada[6]. While the information may be of interest in its own right, the numbers should greatly assist managers in identifying ways of reducing costs and certainly to better understand what is involved in the management of different fisheries. For example, the greater costs of enforcement in the demersal fisheries may be unavoidable given their more

[5] A public service is sometimes defined as one where there is no additional marginal cost when there is an increase in the number of people benefiting from the service. Pure research and fish stock assessment can be examples. For example, it may make little or no difference to the cost of undertaking a stock assessment if there are 10, 20 or 200 fishermen in the fishery.

[6] Data and reference material taken from O'Boyle, R. and K.C.T. Zwanenburg 1996. A comparison of the Benefits and Costs of Quota versus Effort-Based Fisheries Management. 2nd World Fisheries Conference. 283-290.

wide ranging nature relative to the Maritime herring fishery. But it is not clear why resource analysis for herring should be relatively so much more expensive than for the other species groups and the prudent manager would endeavour to discover why. Likewise, the complexity of the demersal fishery is evident from the greater management costs they incur.

Table 1
Percent distribution of groundfish and herring management costs by business line

Element	Groundfish	Herring
Strategic planning	3.4	1.4
Annual planning	1.9	0.9
Service delivery	13.0	12.2
Business analysis	3.6	6.2
Resource analysis	31.0	56.5
Fishing entitlements	0.1	0.2
Catch/effort monitoring	2.5	2.8
Enforcement	44.6	20.0

Percent distribution of lobster management costs

	Inshore lobster	Offshore Lobster
Strategic planning	3.3	3.5
Annual planning	2.7	2.8
Service delivery	12.6	12.6
Business analysis	1.2	3.9
Resource analysis	14.7	8.8
Fishing entitlements	0.6	<0.1
Catch/effort monitoring	7.2	1.2
Enforcement	57.7	67.3

Percent distribution of scallop management costs

Strategic planning	2.5	3.1
Annual planning	2.1	2.6
Service delivery	14.0	12.5
Business analysis	2.9	1.7
Resource analysis	27.6	18.0
Fishing entitlements	0.3	<0.1
Catch/effort monitoring	4.0	2.0
Enforcement	46.5	60.0

In the case of inshore and offshore lobster fisheries, many of the elements are similar but some differences do exist. For example, resource analysis for the inshore sector is much more expensive as is the monitoring of catch and effort. Some of this may be due to the smaller units used in the fishery, but again, the conscientious and inquisitive manager would ask for an explanation of why these costs differ.

In all of the fisheries enforcement is a major cost and a message from this analysis is that effort should be directed to finding different ways of ensuring compliance with regulations. This could involve methods that reduce the incentive to cheat - e.g. by strengthening property rights, forms of co-management or by increasing the penalties for being caught. In fact this last action has just been taken in the Canadian Maritimes region with maximum fines being increased from a few tens of thousands to half a million Canadian dollars.

2.5.2 How Much Should be Spent on Fisheries Management?

This question is self-evidently important and one that the fisheries manager should be prepared to be asked by his minister (and by the industry, especially if they are paying). However, while easily asked, going beyond a theoretical response becomes if not hard, then expensive, to answer confidently.

Conceptually, it can be put to the minister very simply. If the benefits from a management activity exceed their costs, then they can be justified. An economist might say, spend as long as the marginal costs exceed the marginal benefits. But immediate questions then are posed: (a) who is paying - taxpayer, producer or consumer? And, how certain can one be of the benefits that will be obtained? Last, who gets the benefits?

Given that many governments have policy positions stressing reduction of government spending, many unavoidable costs are being transferred to those who are deemed to be the direct beneficiaries. This is referred to as *cost recovery* and it has had several profound consequences.

First, it has sharpened the debate among stakeholders particularly those who are paying, as to what is a justifiable charge to the industry. They argue that much of the past work of government marine research institutions is most appropriately deemed "in the public

interest" and thus should not be charged to the industry. Inevitably, the interest of these stakeholders does not extend beyond stock assessment. As anyone with a scientific background will know, an unequivocal division in the objectives and benefits of marine science research between pure and applied activities is difficult and in relation to some aspects of fisheries management, impossible. For example, research into the area of stock-recruit relationships involves most areas of oceanography and fisheries biology and programmes, and if there is a payoff, it might be in the order of decades. What are the respective funding responsibilities of industry and the public in such cases?

Another important issue if that of *user pays - user says*. On accepting to directly fund management, industry is increasingly insisting, with good logic, on a say in what research gets done, how and by whom. Research managers who in times past had little fear of being second-guessed by others about work plans are having to be not only transparent in regard to their planning but prepared to justify on a cost-benefit basis why a particular policy or programme has been adopted.

Tables 2, 3 and 4 contain preliminary estimates of the relationship between a particular national organizational structure and it's business lines. The estimates are intended to demonstrate what services and facilities actually cost to produce[7]. More accurate careful cost accounting is required to make this a useful tool for determining the effectiveness of public expenditures and for other management decision-making within this fisheries department.

For example, Table 2 shows that of the budget of Fishing and Fishing Industries, the greatest amount is spent on Southern Harvest Fisheries. However, Table 3 shows that of the total amount on Southern Harvest Fisheries, most (35.4%) is spent by the Training and Research Organization. Of expenditures on Inland Waters, almost two thirds is spent on Administration and Finance (Table 2) and one fifth is spent by the Training and Research Organization, presumably on research. Table 2 shows that there is a large difference in the relative expenditures by Administration and Finance for Northern and Southern Harvest Fisheries - 24.1% versus 19.8%. Are these appropriate sums? Is the distribution optimal or does it appear that a different allocation of funds would create more national benefits? To

[7] These data are derived from an actual fisheries department - the challenge is to identify it.

answer this question, comparative analysis is needed of how much additional benefits can be derived from the different sectors by a different allocation of expenditure. The matrix also demonstrates, in budget terms, how different organizations within this Department of Fisheries interact to deliver the services and facilities for which it is responsible. The information possible from analyses, such as that shown in Tables 2, 3 and 4, enables managers to determine if resources are allocated in the appropriate relation to the importance of the activity, and specifically what marginally benefits might be obtained from any additional marginal expenditures[8].

Some observations are possible from Table 2. The cost of managing the Northern Harvest Fisheries was 15.26 billion. The total landed value for these fisheries was estimated as 200 billion; in this case management costs were about 7.6% of the landed value. The cost of managing the 375 billion rial Southern fishery was 21.09 billion or 5.5% of landed value. These costs do not include public expenditures on harbour infrastructure, training, extension or other services. Nor do they consider the private sector costs for operations or capital. This shows one use of Business Line analysis to track performance in delivering effective management at a reasonable cost.

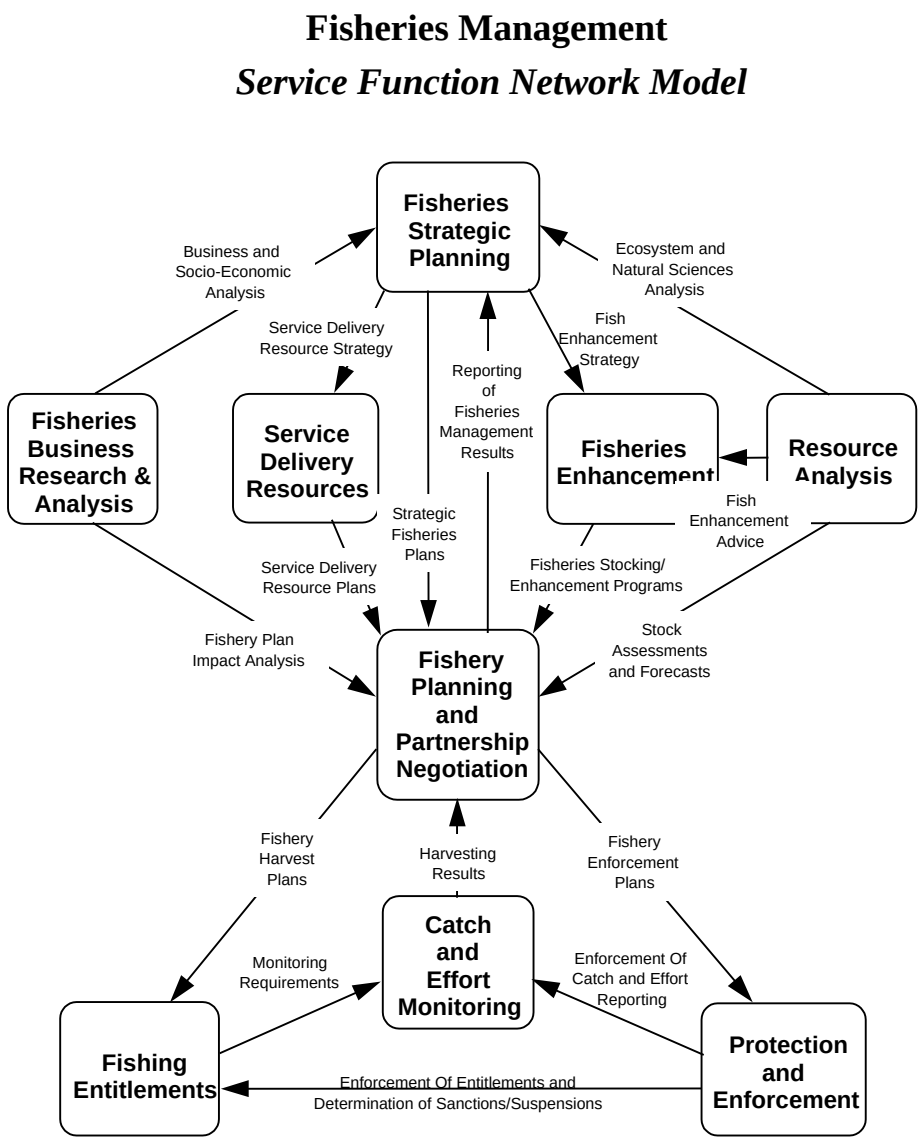
Note that the table indicates that much of this organization's budget is attributed to other Business Lines. Some of these expenditures provide services that are used by the fishing industry in the northern and southern fisheries but they are not harvest management activities. The Business Line approach implies that these activities should be justified on their own merits. The investment in Aquaculture for example should yield a measurable stream of benefits to justify the 19.11 billion invested in it during that planning year.

Public spending on infrastructure such as a port facility, a road, or on training, is considered appropriate in a mixed economy. However individual projects should be justified on a cost-benefit basis. Overbuilding infrastructure in fisheries means fewer funds are available for other public needs such as health care, welfare, education, or even other commercial sectors. The information that is possible from such analyses as shown in Table 2

[8] The concept of marginal costs and benefits is very important. If an additional expenditure (i.e. a marginal expenditure) of $100 will create $110 of benefits then it is justified. Even though the budget of a particular department may already be large, it could be that an additional expenditure of, e.g. $100, in that department will create more benefits (e.g. $120) than if that expenditure was spent in a different department with a much smaller budget. Of course, if a budget reduction of $100 results in a loss of benefits of only $90, then there are 'national benefits' in undertaking the cost reduction.

enables managers to determine if resources are being allocated in appropriate relation to the importance of the activity.

Figure 3
Elements of the Fisheries Management Process



Shows Service Interrelationships Between Fisheries Service Functions

Table 3
Relative (%) Budget Costs by Department

By looking down the column, it is possible to see how each organizational unit spends its budget in relative terms. For example, Education spends a much lower percentage of its budget on planning than do Northern Fisheries.

Business LIne / ***Business Line***	**Northern Fisheries**	**Southern Fisheries**	**Inland Fisheries**	**Aquaculture**	**North**	**South**	**Inland**	**Education**	**Fishing Harbour Infrastructure**	**North**	**South**	**Inland**	**Trading**	**North**	**South**	**Indsutries**	***Fish Meal***
Planning	11.1	11.0	9.4	3.21				2.3									
Fishing & Industry	32.0	33.8	6.8	2.9				22.6									
Aquaculture	-	0.19	-	0.57	0.31			35.1									
Research and Training	32.8	0.19	4.61	0.57	0.31			21.1									
Fishing Harbour Construction		1.39	2.16	1.30	0.50			8.1		100	100	100				100	
Trading Activities														100	100		
Industrial Activities						6.49										100	
Fish Meal						0.51											100
Administration & Finance	24.1	19.8	63.3	11.2				10.7									
Total	100	100	100	100	100	100	100	100		100	100	100		100	100	100	100

Table 4

Current Budget Cost Matrix: By Department
Percentages (%)

Each row the relative expenditure for each business line by organization

Section	Nothern Harvest Fisheries	Southern Harvest Fisheries	Inland Waters	Aquaculture	Training & Extension	Total
Fishing & Industries	35.4	51.7	1.4	1.4	10.1	100.0
Research & Training	33.6	50.0	3.8	3.8	8.7	99.9
Aquaculture	12.7	27.7	24.4	23.9	11.2	99.9
Port Development	35.1	53.2	2.0	3.7	6.0	100.0
Program & Planning	36.4	50.1	5.8	4.7	3.0	100.0
Finance	33.4	37.9	16.0	6.7	6.0	100.0
Trading	94.3	5.7	0.0	0.0	0.0	100.0
Fishing Industry Co.	0.0	100.0	0.0	0.0	0.0	100.0
Fish Meal	100.0	0.0	0.0	0.0	0.0	100.0
Total by Department	30.4	49.5	7.5	6.5	6.1	100.0

Comparison along the rows shows the relative regional distribution of expenditures by department. Comparison down the columns shows the relative variation within a region by department.