

SOCIAL IMPACT ANALYSIS AND THE MODELLING OF SOCIETAL COSTS OF FISHERIES: AN ASSESSMENT

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ABSTRACT

Theorists and modelers have made significant progress in defining ecological and economic parameters for measuring the 'costs' of fisheries. The social dimensions of such universal exercises, however, have barely been worked upon. This is a serious omission. In the context of the EC-funded ECOST programme, a group of social scientists is investigating the value of the job satisfaction approach to the fisheries field. This paper describes the usefulness of job satisfaction for the modeling of societal costs in fisheries, and the problems and opportunities encountered.

Keywords: capture fisheries, job satisfaction, modeling, social costs, sociology of fishing

1. Introduction

This paper strives to contribute to the development of a sociological model for the assessment of capture fisheries. In line with the ECOST project, in which it originates, the authors discuss the social status of a fishery in terms of 'costs' and 'benefits'. The objective is to create a sociological framework that fits into a larger multi-disciplinary model for the assessment of societal costs.

The crisis enveloping capture fisheries throughout the world (FAO 2004), and the acknowledgement of an urgent need for conservation and restoration (Earth Summit, Johannesburg Summit), prompted the development of methodologies to assess and compare the condition of fisheries. The benchmark concept usually employed by scholars in this field is sustainability. Although the World Commission on Environment and Development (WCED 1988), that put sustainable development on the international agenda, took sustainability to have an ecological as well as a social dimension, scholars and policymakers in fisheries have generally focused on the ecological goal. As the authors of the Fisheries Global Information System (FIGIS) argue, the main issue is: "how to ensure sustainable use of fisheries resources when the level of demand has increased beyond what our aquatic environments are able to supply" (FIGIS 2006). The Code of Conduct for Responsible Fisheries (FAO, 1995) promotes a similar line of thought. In its wake, scholars have developed models and databases to establish and compare the impact of fishing activity on marine ecosystems (e.g. [ecopath](http://ecopath.org), footprint analyses¹). More dynamic and purpose-oriented ecosystem models have since appeared (Ecosim, Ecospace).

Attempts to broaden the assessment process, and include other dimensions than the ecological, have followed. RAPFISH, a "rapid appraisal technique to evaluate the sustainability status of fisheries" (Pitcher & Preikshot 2001), constitutes an early attempts at interdisciplinary model-building. The authors of RAPFISH distinguish five dimensions of analysis: ecological, economic, ethical, social, and technological. The social analysis in which we are interested, however, is noted to have "disappointing performance" and is in need of further refinement (Fisheries Centre?, 2005:4).

This then is the background of the present effort, that strives not only to expand but to provide a foundation to sociological model-building in fisheries. Section 2 considers some of the pre-occupations sociologists have about model-building. We then turn, in Section 3, to the selection of variables and the

¹ www.ecopath.org; www.seaaroundus.org/trophiclevel/footprintmain.aspx

justification thereof. Sections 4 and 5 describe an approach centering on the concept of job satisfaction. The final section connects the various strands and formulates an agenda for further action.

2. Sociological pre-occupations

The aim of the ECOST programme is to develop a universal model to assess the costs (or, the value) of capture fisheries in the world. This effort is divided into three disciplinary streams: marine biology/ecology, fisheries economics, and social sciences. During phase 1 each stream will draw up an independent assessment framework. In phase 2 the efforts of phase 1 will be combined into an overall model. The remainder of the programme is meant to test and elaborate the results.

ECOST is therefore primarily a modelling exercise, with quantitative data being fed into the model on the one side, and comparable total figures emerging on the other. At the centre stands a complicated process of measuring, weighing, and aggregating. The foremost questions for the social scientists involved are: what is the *basis* for the selection of input material, and is a universal position possible? Secondly, the question: can everything that might be relevant for an assessment be formulated in modelling terms?

The ECOST programme is founded on the assumption of universalism: that it is possible to compare and value scientific phenomena across the barriers of space and time. This indeed is an assumption of the natural sciences, as well as of most economic sciences. In the social sciences, however, it is a debatable standpoint. The universalist position is based on the notion that people all over the world agree on a set of basics, or otherwise, that one set of basics is intrinsically more valid than others (and may therefore override whatever objections arise).

Comparative sociology is one of the disciplines premised on the similarity of social phenomena.

“Where a sociological analysis is explicitly held to be comparative, this usually involves the study of particular social processes across nation-state, or across different types of society”(Marshall 1994:102).

Such studies aim for the development of general theory, or cross-cultural understandings of the human condition.

For epistemological and moral relativists, however, universalism is a problematical assumption. Their starting point is that:

“What counts as true is a function of criteria which are internal and so relative to local cultures, historical periods, or socio-political interests.” (Marshall 1994:561).

The relativist position is found throughout the social sciences, with anthropologists and historians as its most pronounced representatives.

The authors of the FAO guideline on ethics in fisheries, for example, take the relativist critique seriously, pointing out that “an ethical approach relates necessarily to a particular cultural context (FAO 2005:27). At the same time they argue for the existence of basic human interests and main ethical issues in fisheries. These provide a foundation, through “informed, free, and reasoned dialogue” for the development of a global view on ethics (ibid.:16). We shall return below to the role of participation in adapting a general model to specific situations.

The second issue to be discussed is whether human phenomena can be summarized in the quantitative terms utilized by modellers. Can attributes such as power, love, happiness etc be captured on a common index, aggregated and compared? Is anything lost in this attempt at reduction? And if they are regarded in this way, how reliable are the scores?

Here again there are opposing camps. Scientists in fields such as applied psychology emphasize the progress that is made in operationalizing qualitative social science concepts and adapting them to the needs of quantification. [ref] Others, however, point out the inherent limitations to such efforts [ref].

3. The selection of variables

Assuming that a universalist social science is possible, if in some way it takes account of social and cultural difference, and that social attributes can, at least to a certain extent, be reduced to numbers, we are on our way toward a social science model for fisheries. The question now is how to determine the key variables. Let us first consider how the creators of the first multi-disciplinary assessment method, RAPFISH, tackled this problem.

RAPFISH

RAPFISH is a multivariate, multidisciplinary rapid appraisal technique meant “to classify world fisheries and diagnose their problems” (Pitcher et al. 1998:31). It explicitly takes sustainability and the Code of Conduct for Responsible Fisheries as a reference point, and has been under development since 1996. The latest descriptions of the method (Pitcher 2000, Pitcher & Preikshot 2001; Fisheries Centre 2005) identify five basic dimensions: ecological, economic, ethical, social, and technological.

On the basis of the literature and interviews with experts, the authors of RAPFISH chose 9-12 attributes to represent each dimension. The criteria for the selection of attributes were: that they are easily and objectively scored, that data are available for many fisheries, that scores could easily be refined without disruption to the analysis, and that extreme values of attribute scores could be assigned unequivocally as good or bad in terms of their relationship to sustainability (Pitcher et al. 1998:36-37).

Annex 1 presents the nine sociological attributes included in RAPFISH. A Fisheries Centre fact sheet on RAPFISH (2005:4) informs the reader about how these criteria were selected:

Social attributes reflect how fisheries management practices impact the sustainability of the society or community associated with that particular fishery, as ultimately predicated on ecological sustainability. In a RAPFISH analysis the ‘good’ end of the scale of an attribute reflects social sustainability but low risk to the fishery or ecosystem, whereas scores at the ‘bad’ end may reflect a risk.

This statement reveals a specific approach: unfortunately the RAPFISH analysis on includes the social aspects that impact on ecological sustainability, not the social aspects that have value on their own accord. It is this that invalidates RAPFISH for our analysis. Our purpose after all is to develop a methodology to establish the social costs of a fishery; i.e. the costs of a fishery for the social as an independent realm. This requires a different perspective.

Social concerns

Unlike the economic sciences, that calculate costs and benefits in monetary terms, the social sciences do not provide an unequivocal answer to the question as to what is worthwhile. Sociological theories highlight different aspects of societal life, and do not provide a single, authoritative framework for the determination of social costs.

Concerns differ from principles in that they do not materialize from systematic top-to-bottom analyses but from political discussions from the bottom up – they constitute fields of attention as well as measuring devices for the results of governance effort. (Bavinck et al. 2005: 303)

It is not easy to distil a representative set of common concerns from political discussions as they take place around the globe. We find a foothold, however, in international agreements and declarations. The assumption in the following is that such documents reflect genuine concerns not only of the signatory parties, but of the populations that they represent.

The authors of a recent volume on fisheries governance (Kooiman et al. 2005) argue that a limited number of concerns pervade the international debate. These concerns – ecological health, social justice, livelihood and employment, and food security and food safety - are of a wider nature than fisheries alone; in fact, many have filtered into fisheries from other domains. UN organizations play a crucial role in channeling the international discussion and in constructing an institutional edifice. Important venues for the elaboration of an international agenda in recent years have been the Earth Summit in Rio de Janeiro (1992) and the World Summit on sustainable Development in Johannesburg (2002). The most recent expressions hereof are the Millenium Development Goals (MDG).

The first MDG concerns the reduction of poverty and the improvement of food security. In adopting this objective, all 191 UN Member States commit themselves to the task of reducing, by the year 2015, by half the proportion of people living on less than a dollar a day, and by half the proportion of people who suffer from hunger.

Poverty reduction has been on the international agenda for a long time. Although it is sometimes, as in the MDG referred to above, framed in simple monetary terms, the tendency today is to take a more holistic ‘well-being’ approach (cf. World Bank 2001). In this perspective, poverty is defined not only by financial deficiency, but connected to a broader range of social and economic circumstances. It is also more than an objective condition: the *experience* of poverty is now recognized to be important (cf. Narayan 2000).

Article 25 of the Universal Declaration of Human Rights defines the ethical ground for efforts to reduce poverty and to increase food security. It states that “Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family.” The World Food Conference (1974), the International Conference on Nutrition (1992) and the World Food Summit (1996) have given further expression to the drive for improving food security. Policymakers have often advocated the development of capture fisheries and aquaculture in terms of their contribution to food security of the poor.

Although poverty and food security are concerns in their own right, they are also connected to concerns of social justice. Here again, the Universal Declaration of Human Rights, that includes many references to rights, equality, and inalienability, is a key document. Other UN agencies have continued to define the requirements of social justice on these lines. This has resulted in a body of international agreements with regard to social justice for individuals as well as for groups or categories. The World Commission on Environment and Development (WCED 1988:8), for example, introduced a new notion of social justice by referring, in its famous definition of sustainable development, to the imperative that it “meets the needs of the present without compromising the ability of future generations to meet their own needs.”

The Code of Conduct for Responsible Fisheries (CCRF) grounds its recommendations in this WCED goal of sustainable development. Article 6.2 brings forward a broad perspective on social justice, linking it to the concerns of poverty and food security:

Fisheries management should promote the maintenance of ... fishery resources in sufficient quantities for present and future generations in the context of food security, poverty alleviation and sustainable development (FAO 1995).

Article 6.18 insists on protecting subsistence, small-scale and artisanal fisheries, in view of their contribution to employment, income and food security.

So far we have tried to identify, on the basis of a discussion of international documents, a limited set of societal concerns that could be used as a framework for an assessment of social costs in fisheries. We have highlighted the following three concerns: poverty, or well-being, food security, and social justice. A recent publication in the FAO Ethics Series confirms this choice.

When actual moral values, rules and duties are subjected to ethical analysis, their relation to *basic human interests* shared by people, regardless of their cultural setting, is particularly important (FAO 2005:3, emphasis mb).

The authors then define three ‘basic human interests’:

- Welfare implies material well-being, as well as the conservation of a productive ecosystem, and relates to fisheries as a provision of food and livelihood;
- Freedom, or human self-determination, relates to access to fishing resources, fishers’ self-control and other life options related to fisheries;
- Justice relates to the distribution of the benefits of fishing and to the ownership of scarce resources.

4. The study of job satisfaction

Job satisfaction is part of a broader research effort on orientations to work, which emerged as a research topic in the late 1960s and 1970s (Marshall 1994:707). It is an important concern in organizational behavior research, and a central variable in the study of phenomena ranging from job design to supervision. As Spector (1997:1) points out, “literally thousands of job satisfaction studies can be found in the journals of organizational behavior and related fields.” This literature thus contains a solid starting point for an application such as the one we are attempting for capture fisheries.

Job satisfaction, explains Spector (ibid:2), “is the extent to which people like (satisfaction) or dislike (dissatisfaction) their jobs.” Studies on this topic emphasize the subjective experience of individuals and groups and are generally carried out by means of questionnaires. There are two basic approaches. The first assesses global job satisfaction. The second, called the facet approach, highlights various aspects of the job in question. Although comparisons of the job satisfaction of employees from different countries have been made, the number of countries compared is still very limited. In fact, “only a handful of country comparisons of job satisfaction facets using the same scale” have yet been carried out (Spector, ibid:26). Industrial countries are the ones best represented in the literature.

Social scientists have developed a variety of scales to measure job satisfaction, some of which have become more popular than others. These instruments have been subjected to investigations as to their reliability and validity (cf. Saane et al. 2003), the result being a more complete and perfected tool box. The end user of these scales is generally the organizational manager. The facets in which he or she is interested include satisfaction with regard to the nature of work, pay, promotion, supervision, and the relation with coworkers.

What factors are held to influence job satisfaction? Spector (ibid.:30) distinguishes two categories of antecedents: individual factors, and factors related to the nature of the job and its environment. The literature on the latter contains various perspectives, one of which is the job characteristics theory.

Job characteristics theory argues that jobs have five core characteristics: skill variety, task identity, task significance, autonomy, and job feedback. These characteristics induce three important psychological states that in turn affect the measure of job satisfaction. The three psychological states are: the meaningfulness of work, feelings of responsibility, and knowledge of the results.

Another body of theory considers the existence of work-family conflict. Work-family conflict exists “when demands of the family and demands of the job interfere with each other” (Spector 1997:40). Yet others look into the correlation between job satisfaction and aspects such as pay levels, job stress, workload, and the freedom that employees possess to make decisions about their work. Logically speaking, the various scales for measuring job satisfaction are based on particular understandings of the

relation between the job and its environment on the one hand, and the personal experience of satisfaction on the other.

In view of the general literature on job satisfaction, there are two points that demand attention in our particular undertaking. The first is that job satisfaction theory has a strong foundation in industrial society. The question then arises what other factors, if any, have to be included to make this approach relevant for developing countries with a primarily rural labour force? The second point concerns the fact that job satisfaction theory allows for adaptation of scales to specific purposes and work fields. Here the question is what distinguishes fishing from other occupations, and what aspects of this profession are to be included in the analysis of job satisfaction? The instrument, which is chosen, must also bring out differences in job satisfaction within the fisheries sector, i.e. between different sub-sectors, or métiers.

In the light of the previous discussion on social concerns and basic human interests (see Section 4 above), a job satisfaction scale, in order to be suited for developing countries, would need to incorporate the dimensions of well-being and food security. More than in industrial societies, there are important, basic needs to be met; the extent to which a particular job actually allows an individual to meet such basic requirements can logically be expected to impact his or her job satisfaction. There where the pattern of social justice effects the distribution of basic goods and services substantially, this too is of more than minor concern.

5. Job satisfaction in fisheries

The fisheries sector has seen its small share of job satisfaction studies, albeit with geographical limitations. Most job satisfaction studies in fisheries pertain to industrial countries, particularly the countries of North America, and very few have actually been carried out in the South (but see Pollnac, Pomeroy and Harkes 2001).

Preliminary studies related to work satisfaction in fishing first appeared in the late 1970s and early 1980s (Pollnac and Poggie 1979; Smith 1981; Apostle et al. 1985). A striking aspect in this scientific corpus is the link with Maslow's (1954) hierarchy of needs. Gatewood and McCay (1988:116) explain the theory:

Maslow divides people's needs into several broad categories, which, in his view, must be satisfied sequentially. Survival/security needs are the most basic, and their fulfillment is necessary before other, higher level needs become much of concern. Belongingness/esteem, or social, needs are the next most basic. Finally, if the previous needs are fulfilled sufficiently, people require a sense of personal fulfillment and growth, that is, self-actualization needs are at the top of the hierarchy (1988:116).

All authors make reference to Maslow's hierarchy of needs, although Pollnac and Poggie emphasize the 'looseness' of the connection. They argue: "our intent here is not to test Maslow's model but to simply note the conceptual similarity between our factors and his 'levels' of needs" (1988:890). Others (Gatewood and McCay 1988; Binkley 1995), however, utilized Maslow's model to organize their job satisfaction items.

Pollnac and Poggie (1988) wrote one of the first focused publications on job satisfaction in fisheries. In this article, that discusses job satisfaction among New England fishermen, the authors made use of a 22-item list. Many of these items were adapted from an earlier, general work on job satisfaction (Schletzer 1965), but Pollnac and Poggie added four items unique to the occupation of fishermen. The authors argue that "many of the items used correspond to high-frequency responses, which were derived from open-ended interview with 108 southern New England fishermen who were requested to tell what they 'liked and disliked about fishing'" (1988:890).

Pollnac and Poggie link the 22 items to three facets that are loosely connected to Maslow’s (1954) hierarchy of needs.² The first facet relates to physiological needs and safety, the second facet to love, belongingness, and self-esteem, and the last to self-actualization. In addition to these three facets, Pollnac and Poggie added two questions on overall job satisfaction. The first asks whether a fishermen would still go into fishing if he had his life to live over; the second whether or not he would advise a young man to go into fishing.

This framework was then tested among fishermen in three ports in New England, also including four subgroups or *métiers*: inshore fishing (lobstering, dragging), middle fishing (pair trawling, purse seining and combinations of inshore and offshore fishing), and offshore fishing (dragging and lobstering). The results were significant, demonstrating meaningful differences between fishermen from various ports and subsectors, and apparently did not provoke a rethinking of the framework. The most important overall conclusion was “that there is more to the occupation of fishing than simply making money. Management schemes must take these other, non-monetary factors into account if they want to develop effective and humane management programs”(ibid.:898).

This seminal study on job satisfaction in fisheries gains relevance from the fact that the authors have continued to work on this and related topics, and write a follow-up almost two decades later. In the meantime, a number of other studies on job satisfaction in North American fisheries have seen the light (cf. Gatewood and McCay 1988, 1990; Binkley 1995). All of the authors mentioned above make reference to and build upon each other’s work, that can thus be considered to constitute a scientific corpus on the topic of job satisfaction in fisheries.

In their latest study, Pollnac and Poggie (forthcoming) discuss job satisfaction amongst fishermen in two Alaskan towns. Their hypotheses (p10) are relevant also for our present purposes, and read:

- that there are differences in job satisfaction between various subsectors in fisheries;
- that the structure of job satisfaction among fishers in Alaska may or may not be similar to that found in other geographical regions; and
- that job satisfaction is related to individual characteristics such as age, marital status, etc.

The method they use is very much similar to the one ventured in their earlier publication. Job satisfaction is now assessed applying 21 of the 22 earlier indicators, and again divided into three facets, or factors (see table 1 below). These are now termed basic needs, self-actualization, and place and control. Like before, the authors suggest a connection with Maslow’s hierarchy of needs (p17). **Table 1. Principal component analysis of job satisfaction indicators for the three sectors of the fishery** (Source: Pollnac and Poggie forthcoming: 31).

Indicator	Basic Needs	Self Actualize	Place & Control
<i>Basic Needs Indicators</i>			
Job safety	0.744	-0.106	0.072
Predictability of earnings	0.661	0.028	-0.186
Vessel maintenance/gear	0.608	-0.023	0.412
Mental pressure on job	0.595	0.061	0.031
Your earnings	0.593	0.165	-0.090
Cleanliness of work	0.568	0.012	0.086
Hours spent working	0.563	0.153	0.370
Peace of mind	0.425	0.380	0.334
Time away from home	0.408	0.007	0.298
Healthfulness of job	0.424	0.118	0.262
Physical fatigue of job	0.490	0.081	0.160

² Pollnac and Poggie (1988:890) argue that “our intent here is not to test Maslow’s model but to simply note the conceptual similarity between our factors and his ‘levels’ of needs.”

<i>Self-Actualization Indicators</i>			
Challenge of job	0.079	0.863	-0.025
Adventure	0.151	0.850	0.165
Doing something worthwhile	0.222	0.698	0.155
Working outdoors	-0.117	0.593	0.414
<i>Place and Control Indicators</i>			
Come and go as you please	-0.134	0.255	0.649
Being out on the water	0.098	0.237	0.598
Time to get to fishing grounds	0.212	-0.144	0.502
Opportunity to be your own boss	-0.162	0.494	0.500
Community in which you live	0.116	0.098	0.479
Time for recreation/family activity	0.213	0.152	0.448
Percent total variance	17.723	14.081	12.344

In the following discussion, we reverse the second and the third sets of indicators, this being more in line with Maslow's hierarchy of needs. The first set, basic needs, has eleven indicators, ranging from satisfaction with regard to earnings and the predictability thereof, to job safety and stress. In order to better fit the situation of developing countries, food security might be added as twelfth indicator.

The second set – third in the table – is measured through seven indicators. It looks into attitudes with regard to the working environment, broadly defined, enquiring also into the relationship between the realms of work and family, and into satisfaction with regard to the own community. This set also includes elements that vary pointedly according to one's position in the *métier*. The owner of a fishing unit will therefore most likely provide different answers to variables such as 'come and go as you please' and 'opportunity to be your own boss' than a worker on the same unit. This opportunity to measure the effects of social hierarchy - that is connected to concerns of social justice – is important for our interest in defining the social costs of fisheries.

The third set of indicators – second in the table, has four variables. It follows from the realization, in social science studies, that for many of those employed in fisheries, the non-material components of the job are of prime importance. As one respondent in Alaska told the authors:

Come and fish in Craig but for adventure. In fishing, adventure is the only thing left. No money in it, but it is still fun! (Pollnac and Poggie forthcoming:25).

And yet another:

It is not the money that's important, it is the job. Fishers define themselves by their job. If they couldn't fish, they wouldn't be themselves – they'd have no identity. (ibid.)

Other authors in the corpus on job satisfaction in fisheries emphasize the significant role of self-actualization in the determination of job satisfaction. Gatewood and McCay thus conclude that:

Fishing is not merely a means to an end, but is intrinsically rewarding. [...] Fishing is not just a livelihood, it is a way of life (1988:126).

Pollnac, Pomeroy and Harkes make a similar point for southeast Asian fisheries. They argue that, contrary to the expectation of fisheries managers, fishermen are not likely to be interested in alternative employment.

In all three countries [studied], fishers like their occupation and only a minority would change to another occupation, with similar income, if it were available (2001:541).

From the view of the scholars studying job satisfaction in fisheries, it is the combination of aspects related to the fulfillment of basic needs, social needs, and needs related to self-actualization that determine the extent to which fishers are happy in and with their work.

Researchers in North-America (Binkley 1995, Gatewood and McCay 1990, Apostle et al., 1985) used the same 22 indicators as used by Pollnac and Poggie (1988), in some cases adding some extra items. Apostle et a. (1985) used 4 additional indicators to measure job satisfaction: fellow worker; crowding on fishing grounds; living conditions on board; trip length (dock to dock); and overall satisfaction. In a study on the job satisfaction of fishermen in New Jersey in 1988, Gatewood and McCay used six additional indicators besides the 26 set used by Apostle et al. (1985): work schedule; pitting skill against nature; respect as a fishermen; competing with others; identity as a fishermen; future as fishermen; earnings last trip.

Binkley (1995) has conducted a meta-analysis of these studies and concluded that despite the usage of additional indicators they yield similar results, with basically the same patterns in interrelationships.

The reduction from 22 in Pollnac and Poggie (1988) to 21 indicators in Pollnac and Poggie's forthcoming publication is of some significance. The omitted indicator relates to the "performance of state and federal officials". Fishers have universally targeted the performance of federal and provincial officials as the object of their greatest dissatisfaction (Apostle et al. 1985, Binkley 1990).³ No research has reported variables or subgroups of variables positively associated with fishers' attitudes to the performance of federal and provincial officials (Binkly, 1995). In Binkley's (1995) study on the fishermen of the offshore fishery of Nova Scotia in fact all sub-groups of fishers or non-fishers " performance of federal and provincial officials" is listed as the worst aspect of their work.

³ The only exception is a finding by Gatewood and McCay (1988) that satisfaction with government officials was significantly higher amongst oystermen who as a sub-group had well established relationships with biologists working for the federal government.

6. Conclusion

This paper commenced with a discussion of sociological pre-occupations on the scholarly objective of model-building. There are two issues: first, the fact that human cultures differ considerably in time and space, and the difficulties faced in developing universalist social science theory. The second issue is the difficulty of reducing qualitative social phenomena to numbers. Not taking a definite stand in this debate, we decided to assume that universalist theory and quantification is possible, at least to a degree.

Regarding the selection of universal variables, we turned for a point of reference to social concerns. A discussion of the concerns that permeate international debates highlighted the importance of poverty, or well-being, in connection with food security. It also emphasized social justice. A recent work on ethics in fisheries (FAO 2005), brought forward three basic human interests: welfare, freedom and justice.

If numbers two and three are exchanged, these interests coincide remarkably well with three levels in Maslow's hierarchy of needs. At the bottom stand survival needs – the importance of sufficient income and food. Second come social needs, which we argue also includes social justice. At the top of the pyramid come the needs of individual self-actualization. The sequence of need satisfaction is hypothesized as not being random but sequential: first come basic needs, then social, and last the needs of self-actualization.

Maslow's hierarchy of needs underlies the corpus of studies on job satisfaction in fisheries. This body of knowledge is concentrated on North American fisheries, with very few studies having been carried out outside this region. The North American material, however, provides a starting point for a wider comparison.

The existing studies on job satisfaction in fisheries have generated a list of indicators, divided over three facets, or factors. These facets coincide with Maslow's hierarchy of needs. In addition, many scholars have also utilized single item measures, enquiring into the extent to which fishermen would again choose for fishing if they had the chance to live their lives over, and what they wanted the next generation to do.

For purposes of comparison with other geographical regions and fisheries, the list of North American indicators now need testing and revision. What gives fishermen in Africa, the Caribbean and South-East Asia job satisfaction, and to what extent do these lists coincide with the North American experience? More effort must also be invested in a theoretical investigation of the relationships between the various indicators. This would result also in a set of hypotheses on the dynamics of job satisfaction and the potential impact of varying public policies.

ANNEX 1 RAPFISH SOCIAL VARIABLES

Sociological Analysis

<i>Item</i>	<i>Scoring</i>	<i>Good</i>	<i>Bad</i>	<i>Notes</i>
Socialization of fishing				
Fishing community growth				
Fishing sector				
Environmental knowledge				
Education level				
Conflict status				
Fisher influence				
Fishing income				
Kin participation				

Source: Pitcher 1999:33

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