

A research agenda for small-scale fisheries



A research agenda for small-scale fisheries

By
D. Staples, B. Satia
and P.R. Gardiner

The designation and presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations concerning the legal status of any country, territory, city or area of its authorities, or concerning the delimitation of its frontiers and boundaries.

All rights reserved. Reproduction and dissemination of material in this information product for educational or other non-commercial purposes are authorized without any prior written permission from the copyright holders provided the source is fully acknowledged. Reproduction of material in this information product for sale or other commercial purposes is prohibited without written permission of the copyright holders. Applications for such permission should be addressed to the Senior Fishery Officer, FAO Regional Office for Asia and the Pacific, Maliwan Mansion, 39 Phra Athit Road, Bangkok 10200, Thailand. (FAO-RAP@fao.org).

© FAO 2004

For copies please write to:

Derek J. Staples
Senior Fishery Officer
FAO Regional Office for Asia and the Pacific
Maliwan Mansion, 39 Phra Athit Road
Bangkok 10200
THAILAND
Tel: (+66) 2 697 4000
Fax: (+66) 2 697 4445

FAO/RAP/FIPL, 2004. *A research agenda for small-scale fisheries.* FAO Regional Office for Asia and the Pacific, Bangkok, Thailand. RAP PUBLICATION No. 2004/21 and FIPL/C 10009 (En) 42 pp.

ABSTRACT

Small-scale fisheries make an important contribution to nutrition, food security, sustainable livelihoods and poverty alleviation, especially in developing countries. Despite this significant contribution, the issues constraining the sustainable development of small-scale fisheries remain poorly understood. FAO has recently developed a vision for small-scale fisheries where: their contribution to sustainable development is fully realized. It is a vision where small-scale fishers and fish workers are not marginalized and their contribution to national economies and food security is recognized, valued and enhanced. It also recognises that these people should be empowered to participate in decision-making with dignity and respect through integrated management of the social, economic and ecological systems underpinning small-scale fisheries. To achieve this vision, a range of issues will need to be addressed, supported by timely and accurate information on which to base decisions and action. These issues are grouped around five major themes:

- policy, legislation, governance and institutional arrangements;
- contribution, role and importance of small-scale fisheries;
- management approaches to small-scale fisheries;
- post-harvest issues and trade; and
- Information systems.

This publication provides analyses of the above issues and develops a research agenda to address identified information gaps. These include research on fisheries policies and legislation and their relevance to small-scale fisheries, linkages between small-scale fisheries and large-scale fisheries, linkages with other sectors, structure and institutional arrangements in small-scale fisheries, trade-offs between policy objectives, how to measure the contribution of small-scale fisheries, how to tailor fisheries management to the small-scale sub-sector, improving post-harvest and trade for small-scale fisheries products, and developing information systems that organize the information in a form that is useful and relevant to the different stakeholders. A much greater emphasis is placed on socioeconomic research to augment the more biotechnical approach adopted in the past.

The final section provides a discussion on strategies and mechanisms to bridge the gap between research and action, a step vital to the implementation of policies and management actions to address the issues in small-scale fisheries.

TABLE OF CONTENTS

	<i>Page</i>
Acronyms	v
1. Introduction – background to the research agenda	1
What are small-scale fisheries?	2
2. The vision for small-scale fisheries	5
3. Issues and constraints in achieving the vision	7
3.1 Policy, legislation, governance and institutional arrangements	7
3.1.1 <i>How effective are global development policies for small-scale fisheries?</i>	8
3.1.2 <i>Competing policy goals – are they recognized, and how are they resolved?</i>	10
3.1.3 <i>How can institutions, structures and processes be changed?</i>	12
3.2 Contribution, role and importance of small-scale fisheries	14
3.2.1 <i>Can the profile of small-scale fisheries be raised in national policies and international development initiatives?</i>	15
3.2.2 <i>Improving measurement and understanding of the causes of poverty in relation to small-scale fisheries</i>	16
3.3 Management approaches to small-scale fisheries	17
3.3.1 <i>How do we tailor fisheries management to small-scale fisheries?</i>	18
3.3.2 <i>How are the International Plans of Action on capacity and Illegal, unregulated and unreported fishing best implemented in small-scale fisheries?</i>	20
3.4 Post-harvest issues and trade	21
3.4.1 <i>Are there means of improving post-harvest processes and trade to increase livelihoods and equitable distribution of benefits from small-scale fisheries?</i>	21
3.4.2 <i>What technological advances might augment the efficiency of small-scale fisheries and their management?</i>	22
3.4.3 <i>What will be the impacts of globalization and increased fish trade on small-scale fisheries?</i>	22
3.5 Information systems for small-scale fisheries	23
3.5.1 <i>Scoping the contribution of small-scale fisheries to poverty reduction and food security</i>	25
3.5.2 <i>What are the requirements for designing responsive fisheries information systems?</i>	25
3.5.3 <i>Helping to define the information requirements in support of co-management</i>	26
3.5.4 <i>Developing practical communication strategies</i>	26

TABLE OF CONTENTS *(continued)*

	<i>Page</i>
4. Research priorities to achieve the vision	29
4.1 Research on policy, legislation, governance and institutional arrangements	29
4.2 Research to elucidate the contribution, relevance and importance of small-scale fisheries to national economy and livelihoods	30
4.3 Research on the management approaches to small-scale fisheries	30
4.4 Research on post-harvest issues and trade	31
4.5 Research and required action to develop information systems for small-scale fisheries	32
5. Bridging the gap between research and action	33
Appendices:	
Appendix A: An evaluation of the types and levels of fisheries management and the associated research relevant to small-scale fisheries	37
Appendix B: Pertinent information on tools and techniques that could be used in assessing vulnerability and poverty in small-scale fisheries communities.	41

ACRONYMS

ACFR	Advisory Committee on Fisheries Research
CCRF	Code of Conduct for Responsible Fisheries
COFI	Committee on Fisheries
DOF	Department of Fisheries
EAF	Ecosystem Approach to Fisheries
FAO	Food and Agricultural Organization of the United Nations
FIS	Fisheries Information System
GDP	Gross Domestic Product
IPOAs	International Plans of Action (of the CCRF)
IUU	Illegal, unregulated and unreported
MCS	Monitoring, control and surveillance
NGO	Non-governmental Organization
NPRS(P)	National Poverty Reduction Strategies (Papers)
NR	Natural Resource
UNCLOS	United Nations Convention on the Law of the Sea
WSSD	World Summit on Sustainable Development

1. INTRODUCTION – BACKGROUND TO THE RESEARCH AGENDA

Globally, small-scale fisheries and fisheries-related activities (processing, trading, net-repairing, etc.) make an important contribution to the nutrition, food security, sustainable livelihoods and poverty alleviation of many countries, especially developing countries. Small-scale fisheries usually require only small capital investment, use low technology gear and vessels (often non-motorised) and catch fish for subsistence or local markets (see definition below). The work is often part-time or seasonal and is a key component in the livelihoods of millions of people. Small-scale fisheries are found in coastal marine areas, brackish water lagoons, and along freshwater lakes, rivers and reservoirs. In the Mekong Delta region, for example, more than 15 million people are estimated to depend on fisheries activities on a daily basis, either for incomes, employment or food supply. Although some may be relatively well off, the majority of these people live in rural (often remote) areas, with poor standards of living, unable to influence their operating constraints.

Despite this significant contribution to food security, the position of small-scale fisheries and how they fit into the multiple activities of the rural economy remains poorly understood. Unlike large-scale industrial fisheries, they have a low visibility and receive little attention from policy-makers. They are often open access enterprises that contribute little to the national Gross Domestic Product (GDP) and command little political attention or support through research, subsidies etc. However, because of the poverty associated with some small-scale fisheries, they have tended to receive project support from international development donors but have not received systematic research support to improve understanding of their functioning, governance and human and resource benefits.

To ensure fulfillment of national and international goals for human development and environmental sustainability it is necessary to treat fisheries more comprehensively, and to redress the situation of small-scale fisheries globally. These issues have been highlighted (see Box 1) by the FAO Advisory Committee on Fisheries Research (ACFR). This document identifies some of the major issues affecting small-scale fisheries and provides a research agenda for addressing these issues (taking guidance from the background papers and outcome of a meeting of the ACFR Working Party for Small-scale Fisheries¹). Consideration is also given to the means by which the gap between research and action can be bridged.

¹ FAO (2004) Advisory Committee on Fisheries Research. Report of the second session of the working party on small-scale fisheries. Bangkok, Thailand, 10-21 November 2003.

Box 1: A focus on small-scale fisheries

Fourth Session of the FAO Advisory Committee on Fisheries Research (ACFR), in December 2002:

- highlighted that small-scale fisheries had not received the research attention that they deserved considering the important contribution that they make to nutrition, food security, sustainable livelihoods and poverty alleviation, especially in developing countries,
- noted that although many of the issues (such as user-rights, excess capacity, illegal, unreported and unregulated fishing, trade and incentives, governance, etc.) are common across all fisheries, they need explicit attention in the small-scale fisheries context,
- recommended that a working party be convened to (i) elaborate a draft research agenda, (ii) undertake an evaluation of the role and importance of small-scale (marine) fisheries (subsequently expanded to include inland fisheries) and (iii) outline ways in which the transition to responsible fisheries could be facilitated, bearing in mind the developing paradigm of the Ecosystem Approach to Fisheries (EAF).

The FAO Committee on Fisheries (COFI), at its Twenty-fifth Session, 24-28 February 2003:

- considered “Strategies for increasing the sustainable contribution of small-scale fisheries to food security and poverty alleviation”,
- supported FAO’s initiative to treat the small-scale fisheries sector as a stand-alone agenda item and strongly advocated that more efforts be made to support the small-scale fisheries sector, both inland and marine,
- welcomed the suggestion to elaborate, in the context of the Code of Conduct for Responsible Fisheries (CCRF), technical guidelines on increasing the contribution of small-scale fisheries to food security and poverty alleviation,
- recognized that there was linkage between EAF and small-scale fisheries management and suggested that FAO, through case studies on small-scale fisheries, develop an [adaptive] EAF tool box with rapid appraisal techniques, participatory processes, conflict resolution, integrated resource assessment and management, including co-management, and capacity-building.

Director-General of the FAO convened the Working Party on Small-scale Fisheries of ACFR from 18 to 21 November 2003:

- to undertake an evaluation of the role and importance of small-scale fisheries, elaborate a research agenda for the sector, review strategies and mechanisms to bridge the gap between research and action and provide views on key elements that should be included in the draft guidelines on small-scale fisheries.
- The Working Party and a number of ACFR background papers provided the input for this research brief.

What are small-scale fisheries?

Small-scale fisheries take on a great number of forms and modes of operation in the countries and cultures in which they are found. They include the catching of fish, post-harvest treatment and marketing of the catches, as well as ancillary trades. For these reasons, it would be futile to formulate a universally applicable definition for a sector as dynamic and diverse as small-scale fisheries. Instead, it is preferable to describe the sub-sector² on the basis of the range of characteristics that are likely to be found in any particular small-scale fishery:

² This characterization of small-scale fisheries is that endorsed by the ACFR Working Party, and is a slight modification of the characterization that was used by the FAO Committee on Fisheries at its Twenty-fifth Session. Such a characterization is not inclusive.

*“Small-scale fisheries can be broadly characterized as a **dynamic and evolving sub-sector** of fisheries employing labour-intensive harvesting, processing and distribution technologies to exploit marine and inland water fishery resources. The activities of this sub-sector, conducted full-time or part-time, or just seasonally, are often targeted on supplying fish and fishery products to local and domestic markets, and for subsistence consumption. Export-oriented production, however, has increased in many small-scale fisheries during the last one to two decades because of greater market integration and globalization. While typically men are engaged in fishing and women in fish processing and marketing, women are also known to engage in near shore harvesting activities and men are known to engage in fish marketing and distribution. Other ancillary activities such as net-making, boat-building, engine repair and maintenance, etc. can provide additional fishery-related employment and income opportunities in marine and inland fishing communities.*

Small-scale fisheries operate at widely differing organizational levels ranging from self-employed single operators through informal micro-enterprises to formal sector businesses. This sub-sector, therefore, is not homogenous within and across countries and regions and attention to this fact is warranted when formulating strategies and policies for enhancing its contribution to food security and poverty alleviation.”

2. THE VISION FOR SMALL-SCALE FISHERIES

The small-scale fisheries sub-sector is characterized, therefore, by its dispersed nature, the poor and marginalized people who are involved with it as fishers or in the post-harvest chain, and its positive and negative links with the wider fisheries sector and the environment. For small-scale fisheries to contribute more significantly to poverty alleviation, employment, food security and income generation it will be necessary to make small-scale fisheries more efficient, and in some cases less damaging to the associated cultural and resource assets.

Efficient small-scale fisheries provide a means of enhancing equity and the redistribution of rent from fisheries across relatively large numbers of stakeholders. Improved policy for small-scale fisheries, and appropriate attention to the post-harvest sector, could have the benefit of mainstreaming women's and gender concerns in development policy and planning. There may be spillover effects on other aspects of development policy including health, community empowerment, labour migration and integrated planning of land and water use. There are thus specific opportunities to tackle aspects of poverty alleviation, livelihood-related possibilities and development through small-scale fisheries. Enhancing the efficiency of the sub-sector will help address the Millennium Development Goals and targets (set by the World Summit on Sustainable Development (WSSD)³ Johannesburg 2003) in many countries of the world.

Small-scale fisheries are not easily managed by centralized authorities, and the development of decentralized forms of management is likely to be required, along with appropriate information systems. Small-scale fisheries are, however, confronted with the same issues of access, property rights, sustainability of resource levels, governance, trade and globalization, and alignment with international agreements, with which fisheries as a whole are challenged. Given these influences, what is the vision for small-scale fisheries in the future?

A vision for small-scale fisheries⁴

The vision for small-scale fisheries is one in which their contribution to sustainable development is fully realized. It is a vision where:

- *they are not marginalized and their contribution to national economies and food security is recognized, valued and enhanced;*
- *fishers, fish workers and other stakeholders have the ability to participate in decision-making, are empowered to do so, and have increased capability and human capacity, thereby achieving dignity and respect; and*
- *poverty and food insecurity do not persist; and where the social, economic and ecological systems are managed in an integrated and sustainable manner, thereby reducing conflict.*

³ World Summit on Sustainable Development (WSSD) – see <http://www.johannesburgsummit.org/>

⁴ This vision for small-scale fisheries was developed by the ACFR Working Party following review of the key issues and options for improved management in the context of multiple uses of marine, estuarine and inland waters and the ecosystem approach to fisheries, with special emphasis on poverty alleviation and food security in developing countries.

3. ISSUES AND CONSTRAINTS IN ACHIEVING THE VISION

The vision for small-scale fisheries is couched in human and development terms. The means to address the vision therefore lie strongly in the (i) strengthening of the profile of the sub-sector and protection of the current assets of small-scale fisheries, (ii) establishing their appropriate placement vis-à-vis fisheries as a whole, and (iii) establishing small-scale fisheries within other sectoral and development contexts. Fulfillment of the vision requires that policy and socio-economic criteria governing small-scale fisheries, fishers and other stakeholders be established and met. Improved resource and environmental management are implicit to the proper and effective functioning of small-scale fisheries.

The vision will only be met by addressing several of the major issues that confront small-scale fisheries today. The wide range of issues that specifically impact small-scale fisheries are here collected around five major themes to be addressed.

These themes are:

- policy, legislation, governance and institutional arrangements;
- contribution, role and importance of small-scale fisheries;
- management approaches to small-scale fisheries;
- post-harvest issues and trade; and
- information systems.

This section assesses each of these themes and sets of issues that confront small-scale fisheries in more detail. In order to provide a framework for the development of a research agenda, the major issues are first described under the thematic heading, and activities and interventions currently in place to address the issue are then briefly presented. Some of the component issues highlighted below are external to the fisheries sub-sector, while others need to be dealt with within the sub-sector itself – and yet others span both. The theme-based framework facilitates the development of the research agenda (presented in Section 4) that will assist FAO and the global community in implementing strategies for increasing the contribution of small-scale fisheries to human well-being and sustainable development.

3.1 Policy, legislation, governance and institutional arrangements

Policy is needed to guide the development processes (in fisheries and in general) and to address issues caused by power or market imbalances. It is the starting point that sets out the objectives and framework to guide the development of legislation, related institutional arrangements, and actions and decisions impacting on small-scale fisheries. Policy can be articulated formally or informally, by governments or other stakeholders, either jointly or independently. It can take the form of international agreements and commitments, or policies at national or local levels.

Ineffective governance has led to overcapacity and over-fishing, illegal, unreported and unregulated (IUU) fishing and other challenges affecting fisheries in general. Many countries have adequate overall policies for fisheries, but there are serious shortcomings in ensuring compliance, or confusions in national and local responsibilities operating at the level of institutes and resource management. Capacities for policy research and development are often low in the fisheries sub-sector in developing countries. However, interventions at policy level create

opportunities to make major changes in the efficiency of small-scale fisheries and this section highlights some of the key questions:

3.1.1 How effective are global development policies for small-scale fisheries?

During the past decade or so, development policies – and thus the focus of development aid – have changed radically. Previously, “structural adjustment” was the dominant policy option which favoured trade liberalization, deregulation and stabilization, that assumed that the poor would benefit along with other sectors of society. More recently, the need to focus more directly on combating and eradicating poverty has been realized. Initially, poverty was considered as being congruent with income poverty (measured by simple economic indicators, such as the international poverty line of US\$1/caput/day). It is now accepted that poverty is a complex issue characterized by low income, poor health, under-nutrition, low educational opportunities and attainment, inadequate housing and living conditions. It is highly correlated with social exclusion, marginalization, vulnerability (susceptibility to falling into poverty) and lack of power. It is also a dynamic concept with people moving in and out of poverty depending on circumstances. The need to focus on poverty alleviation was further endorsed at the recent WSSD where a plan of action to halve the level of poverty by 2015 was adopted (as measured by income, level of hunger and access to safe drinking water).

Box 2: Development assistance to small-scale fisheries

Over the past 50 years a significant amount of development aid sponsored by national, bilateral and multilateral funding has been spent to raise the standard of living of small-scale fishers and their communities in developing countries. No recent estimates are available but an earlier estimate reported a total of US\$3.73 billion in the period 1974-85. FAO currently has projects that involve small-scale fisheries valued at ~US\$80 million.

(Source: Neiland, 2002).

The main aim of most interventions for small-scale fisheries over the past two decades has been to promote “fishery development” based on the assumption that these interventions would lead to internal transformation of the sub-sectors and hence to poverty alleviation and increased food security. Interventions have included:

- improving technology (both gear and fishing vessels);
- improved post-harvest processing and marketing;
- provision of credit;
- improving fishery management through allocation of user rights and access control;
- reallocation of fishery resources (e.g. between small-scale and large-scale fisheries);
- enhancing fishery resources through restocking;
- increasing aquaculture to relieve pressure on capture fisheries;
- improving resource and environmental conservation measures;
- focusing on management through community-based initiatives;
- adopting new participatory and co-management approaches;

- training and capacity building;
- raising awareness of the importance of the contribution of small-scale fisheries to livelihoods, food security and quality of life;
- increasing economic growth and providing a wider diversity of employment and livelihoods; and, more recently,
- providing assistance in setting policies with their supporting legislation and institutions.

In general, the consensus is that these interventions have not been particularly successful (though with some exceptions) with respect to small-scale fisheries. The causes of failure are varied and range from poorly formulated policy to poor implementation of strategies, poor monitoring and lack of follow-up. It is, therefore, not possible to conclude that the intervention itself was not worthwhile. However, it has become apparent that because poverty – and the causes of poverty – are extremely complex, they cannot be addressed by simply transferring technology and capital investments. An integrated set of interventions is needed, including policy enhancement and social support mechanisms. For example, if over-fishing is the problem, restocking may be an option, though this would need to be complemented with seeking supplemental livelihoods and re-directing fishing through an incentive scheme during the period of stock rebuilding.

Changes in development policies have far-reaching effects. As well as direct influence in terms of supporting various interventions, the dominant paradigm of the day also influences national policies and their incentive and disincentive schemes. For example, based on some of the earlier “fishery development” interventions, many developing countries are either subsidizing large-scale fisheries to promote their development at the expense of the small-scale sub-sector, or assisting small-scale operators to adopt more modern technologies in the belief that they will then become more “modernized” larger-scale operations. There are also cases of countries subsidizing both sub-sectors.

In fisheries, policies that have promoted increased economic growth at the national level have tended to favour the development of large-scale approaches over small-scale ones. A consequence is that the resources tend to become concentrated in fewer and fewer hands. There is some indication that during periods of sustained economic growth (e.g. in Asia), the level of poverty has decreased, but these findings tend to be based on simple economic indicators (e.g. income/caput/year) at aggregated national or regional levels. There is very little information on how changes in economic growth affect poverty in fishing communities. Some countries have shown rapid economic growth, but have not shown corresponding improvements in human well-being (as measured through one or other of the accepted poverty indices). In countries where policy implementation is poor and where the power is concentrated in the wealthiest section of the society, the flow-on effects to the poor are likely to be negligible.

Interventions that have attempted to establish some sort of property rights for fisheries, followed by appropriate management and governance systems, have had more success, although they often fail when local conditions and constraints have not been taken into account, or when there were weak linkages between national policy and on-the-ground management objectives. An important success criterion should be that new management arrangements become sustainably funded from rents generated by fisheries, and not remain dependent on development aid. This has rarely occurred.

Research implications

The major research question is to what extent the current paradigm for development policy takes into account the nature and characteristics of small-scale fisheries. Policies must especially recognize the common property nature of the fishery resources, the fact that they are renewable but limited, and that they are part of a complex web of multiple uses and users. A related but critical question is whether small-scale fisheries are a useful entry point for the alleviation of poverty. If the answer is yes, then which of the above interventions have worked best and why? Better understanding is required of small-scale fisheries with the respect to their socio-political circumstances, the policy and legal frameworks and the local conditions in which interventions are likely to succeed or not. Review and analyses of project and programme evaluations should also provide insights into the causes of failure (within the current development policy paradigm) and point to alternative approaches. Research is likely to provide better overall analyses of these approaches to guide future development assistance.

More socio-economic research is required in order to understand the links between macro-economics, fisheries and development policy and livelihoods. The Sustainable Livelihoods Approach provides a useful means to do this when coupled with indicator development. It will be instrumental in determining whether fishers enter fishing because of their poverty status or because of the general socio-economic structure of the locale in which they live. Studies on the distribution of wealth and power relationships in small-scale fisheries are also required to ensure that the flow of benefits from proposed improvements will continue on an equitable basis. Few former assessments of small-scale fisheries (or other resource sectors) identify how they are structured and how power is distributed.

3.1.2 Competing policy goals – are they recognized, and how are they resolved?

Many countries in the world have agreed to a number of high-level principles relating to fisheries and ecosystem management (e.g. the Code of Conduct for Responsible Fisheries). Within these principles, however, decisions need to be made on how countries are going to address the issue of poverty in the context of small-scale fisheries. Whilst this is a question of integrating policy goals at higher levels, it also has practical implications at the level of management and is discussed below (see Section 3.3.2).

A key factor in strengthening governance and institutional support for small-scale fisheries will be to assist countries in resolving the competing policy imperatives of:

- (i) optimal and sustainable use of fish resources and their supporting ecosystems;
- (ii) economic objectives, especially in relation to either small- or large-scale fisheries;
- (iii) social objectives, including maximizing employment and improving livelihoods;
- (iv) objectives related to equity, including access for only small-scale fisheries; and
- (v) any other objectives (for example trade liberalization, market access etc.) which may have impacts on this sub-sector.

Very few fisheries, either large-scale or small-scale, have adequately considered and resolved the trade-offs among these objectives. Clear policy goals and trade-offs are required to enable effective fisheries management to be framed. For example, trade-off agreements need to be reached on:

- equity versus efficiency;
- maximising sustainable yields (and economic benefits) versus widespread employment and providing a safety net for the poor;
- export-oriented production versus national food security;
- imports versus national self sufficiency;
- large-scale versus small-scale fisheries;
- long- and short-term management goals;
- market liberalisation versus protection of small-scale fisheries; and
- foreign fishing vessels versus local fleets.

In fisheries, this lack of clarity with respect to the objectives often leads to conflict amongst competing sub-sectors (e.g. small-scale fishing vessels versus large-scale fishing vessels) resulting in many management interventions implemented to address the symptoms, not the problem itself.

Fishery policy objectives relating to the small-scale fisheries sub-sector need to deal with conservation, economic and social equity objectives. These objectives may be supported in policy by a wide range of tools/strategies as shown in the example below (Table 1). The list is illustrative rather than comprehensive:

Table 1: Illustrative example of differing goals for fisheries management and aspects of the respective approaches that each might entail

Objective	Related tools/strategies and ideals
Conservation, sustainable resource use	<ul style="list-style-type: none"> • Provision of access rights • Appropriate data collection • Ecosystem management • Compliance with international conventions • Effective monitoring, control and surveillance (MCS)
Economic	<ul style="list-style-type: none"> • Increased export earnings • Improved marketing/processing and value-added • Technological provision and modernization • Credit provision and modernization • Credit provision and saving schemes • Collection of resource rent/licensing, royalties • Economic diversification
Social/Equity	<ul style="list-style-type: none"> • Maximizing employment • Ensuring food security • Participation of stakeholders • Support for fisher and fish worker organizations • Human capacity development • Alleviating poverty • Provision of safety nets • Access rights • Support for customary rights • Utilization of bycatch • Gender issues

While not universally the case, formal government policy objectives relating to conservation are generally not specific to small-scale fisheries in most government policy documents, but rather apply to both small and large-scale fisheries. This also tends to be true of economic objectives, or with the *de facto* implementation of policies with time, orienting government attention more towards taxes or export revenues from industrial fisheries rather than on objectives for small-scale fisheries. Social and equity objectives often relate more specifically to small-scale fisheries than the sector as a whole, but may be less well articulated than conservation and economic objectives. Crucially, policy formulation requires contradictions and trade-offs between competing objectives to be confronted, but such trade-offs are often not sufficiently dealt with or articulated explicitly.

Fisheries policy, and policy in other sectors, have the potential to benefit small-scale fisheries if carefully articulated and integrated, but this integration with other sectors in particular is often insufficient. However, there are current global trends towards greater participation, integration, and governance in natural resource and other sectors. The relevance and benefits of government policy to small-scale fisheries are likely to increase when small-scale fishers and fish workers are actively involved in the policy development process within the fisheries sector, and can influence the process in fisheries and in other sectors.

Research implications

Policy and decision-makers require some sort of decision support system based on cost/benefit analyses to make the necessary trade-offs, coupled with data collection activities to monitor and, if necessary, modify decisions. For example, how would the potentially high costs associated with small-scale fisheries management compare with the costs of resource depletion, loss of employment, income and food security, both in terms of economic and societal values, if no management system was in place? What compensation might be necessary to reduce fishing capacities of large-scale fisheries (e.g. through a buy-back scheme) and how does that compare with the potential benefits that may be derived from the small-scale fisheries? One approach to answer these questions and scenarios is to develop fairly well-elaborated models of the system and input of, at the very least, basic economic data to gauge benefits and costs under different scenarios. However, useful results could also be achieved through sharing and exchange of existing experience and knowledge, the so-called participatory research approach. More work is needed to examine the impacts (particularly social impacts) of policy, such as supporting aquaculture as an alternative to fisheries management. The approach also needs to involve the broader sets of policies such as trade policies that impact on small-scale fisheries, and which could play a major role in changing the status quo. These research findings need to be fed back to the policy-makers.

3.1.3 How can institutions, structures and processes be changed?

Transforming policies, institutions and processes can influence the access which people in small-scale fisheries have to various assets, the terms under which those assets are traded, and the value of the outcomes of livelihood strategies. Policy development to support small-scale fisheries requires appropriate institutional arrangements and effective organizations and structures. They will include fisheries sector policies, but may include a diversity of other policy areas that relate to small-scale fishers and fish workers such as poverty alleviation policies, rural development policies, and education and health policies (see Box 3).

Box 3: Examples of different structures/institutions and processes related to small-scale fisheries

Institutions:	Processes:
Policy-making and planning departments	National development policies
Enforcement agencies and courts	Fisheries sector policies
Fisheries management bodies	International agreements (e.g. Code of conduct for responsible fisheries (CCRF), United Nations Convention on the Law of the Sea (UNCLOS))
Regional fisheries management and development bodies	Regulations and rules governing fishing, trading and food quality
Fisheries research and extension agencies	Markets for fish
Government inputs suppliers	Licensing arrangements for both local craft and foreign vessels
Commercial enterprises and corporations providing inputs to the sector	Societies norms and beliefs (such as prohibitions on eating types of fish at certain times)
Non-governmental Organizations (NGOs)	Age, gender, ethnic groups, class
Trade organizations at a higher level than the community or group	

Source: Satia (2003).

Institutional arrangements are also required to ensure cross-sectoral integration. They must be supported by relevant and effective processes, especially participatory processes including small-scale fishers and fish workers. Some policy objectives may need to be incorporated into institutional arrangements through formal legislation, while others might be more appropriately dealt with through informal and codified rules, or through economic instruments. Improving institutions, together with the development of relevant knowledge about small-scale fisheries, are key aspects of bridging the gap between research and action (Section 5).

Research implications

Current institutions, policies and processes in many countries work to the detriment of small-scale fisheries. Making these institutions, policies and processes more positively oriented to the small-scale fish workers will be a major part of any development effort using the Sustainable Livelihoods Approach. Transforming policies, institutions and processes can affect the entire framework, so particular care is required as poorly managed fisheries affect the vulnerability context in which fish workers operate. Legislation may limit the involvement of the small-scale fisheries workers in decision-making processes and thus reduce the effectiveness of their social assets. When looking to transform policies, institutions and processes it is useful to look at roles, responsibilities, rights and relations of the different participants in these policies, institutions and processes (e.g. what rights do fish workers have in defining fisheries management objectives? Whose responsibility is it to enforce the legislation on fishing gear? What is the relationship between the fisheries department and part-time fish workers?).

More institutional and legal research is needed to provide better advice on how to set up successful institutional and legal frameworks. FAO currently has a compendium of fisheries legislation, but it is incomplete and out-of-date. If this database were updated, analyses of these data could lead to better guidelines on how to construct legislation to support small-scale fisheries and how to draw up complementary laws to support traditional law and government policies such as decentralization.

The aim is to build institutions which will allow workers in small-scale fisheries to be more effective (such as mechanisms to allow the fish workers to participate in the policy process or to contribute to research prioritization) or which allow the government structures to be more focused on the needs of the small-scale fisheries workers. Help can also be provided to fisheries departments to gain the skills they need to facilitate greater participation of the sub-sector in planning their own development and contributing to the sustainable use of the fisheries resources. Decisions on the implementation of existing legislation, or for the development of new legislation in line with agreed policy objectives, would assist in the governance of the small-scale fisheries sub-sector in some developing countries.

Creating property rights over fish resources for small-scale fish workers or introducing community-based co-management structures will also be important, but there is little research in terms of assessing “lessons learnt” by the many interventions tried in pilot/demonstration sites around the world. Improving access of products from small-scale fisheries to markets may also be important, as may limiting the dumping of industrial catches on domestic markets. Risk reducing mechanisms, such as insurance schemes for fish workers may be facilitated through changes in the legislation or through the provision of guidance and information. Research should focus on what exists currently, what works best and how policies, institutions and processes can be developed or revised to improve the performance of the sub-sector in the future.

3.2 Contribution, role and importance of small-scale fisheries

For millions of people in Africa, Asia and Latin America, small-scale fisheries provide an important source of food, employment and income. In particular, small-scale fisheries are estimated to contribute half of the food fish in the World and are thought to provide 19 percent of the animal protein intake of the developing countries population. Despite these crucial roles in relation to such central issues as rural development, poverty alleviation, and food security, small-scale fisheries are still largely neglected by existing decision-makers and planners in developing countries and absent from discussions relating to national poverty reduction strategies (Béné, 2003).

Among the most important factors explaining this lack of recognition is the failure to estimate the real role that small-scale fisheries play in the economic growth of developing countries and the role of fishing activities at the micro-level (household and local economies). This clearly demands that a better understanding of the complexity of the small-scale fishers livelihoods be developed. This needs to include evaluation of diversification of activities over time, within households and communities, and the role of fishing and related activities as secondary/complementary occupations. On the other hand, there seem to be large potentials within the small-scale fisheries sub-sector that have not been fully realized due to a mixture of socio-institutional constraints and unfavorable policy or legal contexts. Capturing this potential could support economic growth, and – given the right conditions – the potential for positive (more equitable) effects on the redistribution of wealth.

The relative dearth of information about the conditions of poverty of fishing communities does not permit a clear understanding of the specific elements contributing to it, or the factors governing their vulnerability. The extent to which poverty in a fishing community reflects the overall poverty conditions affecting rural populations or is the result of specific mechanisms intrinsic to the sub-sector is unclear. A better understanding of the role of women and their contribution to the household economy within fishing communities also calls for more attention, beyond the ‘classical view’ assumption of women as a processing/trade agent.

3.2.1 Can the profile of small-scale fisheries be raised in national policies and international development initiatives?

Small-scale fisheries are often marginalized or ignored in national and regional planning and policy development. Recent analyses have shown that many of the national Poverty Reduction Strategy Papers (PRSPs) that are being developed do not, in general, include small-scale fisheries. Given the importance being placed on these documents, this is a serious concern. In raising the profile of small-scale fisheries, two gaps need to be addressed, firstly, inadequate information and poor understanding of some of the fundamental mechanisms affecting the socio-institutional dynamics of the sub-sector and, secondly, the lack of communication of the patchy (but useful) information already available.

In many cases “official” statistics underestimate the true situation (see Box 4). This is partly explained by the lack of human and institutional capacities (often related to budget constraints) of the national institutions in charge of these statistics – Departments of Fisheries (DOF) but also research institutes. The very scattered and remote location of most small-scale fisheries further exacerbates this lack of information.

In terms of communication problems, there are many reasons that could be put forward why small-scale fisheries have tended to be overlooked and marginalized over the years, despite the overwhelming evidence that they are important. The first is the institutional make-up of the Ministries and Departments themselves, which has often been based on those of developed countries (for example, fisheries are often only a small section of a larger agriculture department). The backgrounds of senior staff and ministers are often in agriculture rather than fisheries, for which they have no training or past experience. A further reason is that small-scale fishers are often from the lowest economic strata and have little voice, except when there are crises.

Box 4: Small-scale fisheries – facts, statistics and numbers

There are many statistics on the contribution of small-scale fisheries, but all are qualified in that they are not accurate. The basic statistics are often informed guesses, or in many cases simply not collected at all.

Most fishers are not licensed and operate on a part-time or seasonal basis. A large number are also involved in the processing, marketing, transportation and other service sectors. Coates (2002), for example, demonstrated that the estimated total world figure of 4.5 million people employed in inland capture fisheries was easily exceeded by a more detailed study of eight countries in Asia alone. Data collected from projects conducted in the Mekong Delta indicate that the production is several times higher than that officially reported. Similar project information from the coastal waters of the Philippines and Viet Nam suggest that actual production may be as much as three times that reported. Seilart calculated that on the basis of census data for the Philippines up to half of the whole population of that country is involved in some way in artisanal fisheries, a figure that underlies the importance of artisanal fisheries to the rural poor.

Of the top seven fish-producing countries, five are developing countries. Three of them (China, India and Indonesia) have populations of nearly 1 billion people living below the UNDP poverty line of US\$1 per day. Current figures suggest that artisanal, small-scale fisheries contribute more than 25 percent of the world’s catch and account for more than half of the world’s direct human consumption (FAO). It is also estimated that there are at least 35 million people employed in the marine and fresh-water production components, of which 80 percent work in Asia and approximately 80 percent of these are small-scale or artisanal fisher folk. In terms of GDP, however, the small-scale sub-sector is a minor contributor.

Policies are often economically driven and where small-scale fisheries are insignificant contributors to GDP, they are largely overlooked. Commercial fisheries are seen as a source of taxes while small-scale fisheries do not attract much public attention and remain relatively unknown. On the political front, attempts to impose management regulations on small-scale fishers often leads to unfavorable political exposure due to the perception that the livelihoods of the poor fisher is being threatened.

In general, small-scale fishing has often been perceived by planners and policy-makers as a sub-sector that “takes care of itself”. A long-held view (still held in some countries, especially in Latin America) was that these fisheries could be “modernized” and larger-scale industrial fisheries have been systematically favoured in the belief that the benefits derived from the newer fisheries would flow through the economy to the original participants. It has further been argued that aquaculture will grow at such a rate that it will be able to compensate for the reduced supply of fish resulting from poor management and that the original participants would be better off by taking up fish farming. However, despite interventions along these lines, small-scale fisheries have not been displaced in either developed or developing countries. In fact, there are now more small-scale fishers producing protein for human consumption than ever before and the need for solutions to the many issues is even more urgent.

Research implications

Two related research needs arise from this discussion. The first is how to measure the contributions made by small-scale fisheries, and the second is for policy research to gain a better understanding of why small-scale fisheries are often ignored in policy development and implementation processes.

Better estimates of the various contributions made by small-scale fisheries are urgently needed. (Research in relation to poverty is addressed in more detail under theme 3.2.2, below.) However, conventional methods of sampling and data collection (used to collect information on large-scale fisheries) are impractical or too expensive to apply to the very widely dispersed fishing communities and markets throughout the world. They also focus only on fisheries and tend to overlook the multiple use and multiple user nature of aquatic resources.

Several hypotheses as to why small-scale fisheries have tended to be ignored in the past are put forward above. Much more work is need to test these hypotheses, identify the real reasons for their marginalization and seek mechanisms for integrating this sub-sector into mainstream policy and planning processes. The roles (authorization and responsibilities) of the different government or non-government agencies, especially national and local planning bodies, need to be much more clearly defined with respect to the multiple uses of aquatic resources. A research programme is further elaborated in the next section of this report.

3.2.2 Improving measurement and understanding of the causes of poverty in relation to small-scale fisheries

Improved methods for measuring poverty are developing quickly (see Appendix B). A number of single indicators – that focus almost exclusively on health, education, or income – have been advocated as measures of the extent of poverty, but each is probably insufficient for detailed evaluations of causation and mitigation. A number of composite indicators have also been developed to give a more general measure of poverty and living standards. The United Nations defines poverty as “*denial of choices and opportunities most basic to human development – to lead a long healthy, creative life and enjoy a decent standard of living,*

freedom, self esteem and the respect of others". The use of a Human Poverty Index (HPI) is advocated as such indices have been developed to measure the level of deprivation and poverty being experienced in a country. There are two HPI indices most commonly used; one for less developed countries and another for the rest. Although these indices exist, there are very few studies that focus on assessing and identifying the extent, nature, causes and dynamics of poverty in situations involving small-scale fisheries (Macfadyen and Corcoran, 2002).

Research implications

The Sustainable Livelihoods Approach (SLA) is a useful analytical tool that can be used to understand fishing communities, their level of dependence on the fish resources, their ability to engage in alternative livelihoods activities as well as the broader legal and institutional constraints in which they operate. It is a multi-sectoral approach based on participation of the stakeholders that makes it particularly relevant to identifying the nature and causes of poverty in the context of small-scale fisheries. It should be able to test some of the hypotheses advocated over the years. For example, is small-scale fishing an "activity of last resort" and to what extent are the resources "open access" and so on?

By design, SLA is usually applied in situations where one is dealing with geographically small units. The development of realistic participatory poverty measurement methodologies that can be used to evaluate poverty-reduction policies across broader scales will also be needed. Related techniques include Participatory Poverty Assessments, Well-being analyses, Poverty Mapping, Wealth Ranking and Poverty Profiling. The sectoral approach outlined in the FAO technical guidelines on developing a set of agreed indicators to evaluate how fisheries contribute to sustainable development (FAO, 1999) could provide a complementary methodology, but such an approach needs to be tested in the context of small-scale fisheries.

Development of these methodologies will assist in answering important questions such as: What is the proportion of people in transitional and chronic poverty in small-scale fisheries? How are different members of the community affected? What are the main contributing factors to poverty and what type of policy interventions are necessary to address them?

Macfadyen and Corcoran (2002) list a large number of other areas requiring further research within the SLA framework, including better analyses of the linkages between different types of assets, increasing the value of information (especially that derived from traditional and local sources), and understanding cross-sectoral linkages as well as more research on the process itself in terms of getting better participation and links between SLA and other more traditional economic appraisal techniques.

3.3 Management approaches to small-scale fisheries

It is well recognized that fisheries management based on scientific information, stock assessments and controls on the harvesting of target resources (with appropriate monitoring and enforcement) that has formed the basis of fisheries management in the northern hemisphere (and more recently transferred to the southern developed countries) is often not applicable to small-scale fisheries that are multi-gearred, multi-species and characterised by a mobile group of harvesters. In general, it is concluded that this type of management is too expensive, too uncertain, and not practical. However, pursuit of this form of management has delayed the introduction of fisheries management based on setting management objectives supported by a broad range of research to assist in policy formulation and broader fishery assessments. This leads to two major questions in relation to small-scale fisheries management:

3.3.1 How do we tailor fisheries management to small-scale fisheries?

Noting the failure of these more conventional fisheries management approaches, especially in developing countries, a range of alternative approaches have been advocated. These include:

- broader systems approach within the fisheries sector (e.g. the ecosystem approach to fisheries);
- integration of natural resource management across sectors (e.g. for integrated coastal area management, large marine ecosystems, and sustainable livelihoods);
- decentralization and participation at the community level (e.g. for co-management);
- introduction (or in some cases re-introduction) of rights;
- area and time closures, including marine protected areas and exclusion zones;
- improved governance systems;
- incentive-based approaches (as opposed to command and control approaches) especially market access; and
- market-based approaches (e.g. certification and ecolabelling).

The introduction of one or another of these alternative approaches pre-supposes that the policy trade-offs have been made and a legal framework exists to implement the required management. For example, applying a management regime that results in the reallocation of resources through the introduction of access rights (in whatever form), presupposes that there has been a parallel decision made that the long-term increased ecological and economic benefits for the fishery as a whole outweigh the social disruption and unemployment that will result in the short-term.

In many countries, traditional approaches – involving right-based access to the resources, rules and regulations governing their uses and an agreed set of sanctions – have been made dysfunctional through the development of more central government control mechanisms. More basic social research is required to better understand existing social networks and traditional forms of management as a basis for developing alternative governance regime in particular countries. This may form the basis of understanding new forms of co-management. However, the uncritical readoption of traditional systems may not be appropriate in the context of the modern, more inter-connected world, dominated by increasing technology, global markets and economic paradigms. For example, in the inland fisheries of Bangladesh, when the state attempted to transfer property rights over fishing grounds through the fisheries co-operatives, it was the lessees (fish merchants and money lenders) that captured the rights and benefited from the rent generated.

Many case studies throughout the world have highlighted the problems associated with a top-down, central management regime, especially in countries where the types of fisheries are extremely diverse, scattered geographically and employ large numbers of people. In more recent years a move towards co-management has led to greater involvement of communities with the setting of management objectives, rules and enforcement/incentive schemes. However, in many of these cases the role and responsibilities of the different players (national governments, state/provincial governments, local governments/councils, communities, fishery organizations, individuals and NGOs) are often unclear and there is often a very tenuous link between central agencies and community activities. In addition, although governments may indicate support for co-management, they are often implemented without full adoption of the principles of co-management, appropriate regulations, administrative procedures and authority structures.

Cochrane (in press) provides an interesting basis on which to start examining small-scale fisheries and tailoring their management. Based on a hierarchy of human needs, he points out that in many of the countries where small-scale fisheries are prevalent, the level of human development is so low that the goals of the individuals in obtaining basic needs would greatly over-ride any higher needs such as long-term sustainability of the resource. When a fisher is trapped in a fishery where there are no alternatives in which to invest his/her capital or time, the choice of taking an unsustainable catch today or leaving the fish in the water is academic. In economic terms, the discount rate will be very large for the 800 million people in the world classified as chronically undernourished. Food today will have substantially higher value than food tomorrow and is likely to be infinitely more valuable than the promise of food in the future. He argues that the only way to get out of this trap is to address the larger problems of poverty, hunger and under-development.

Research implications

A better understanding of human needs and livelihoods is needed. Different approaches will also need to be tried and tested through a process of learning and adaptation. Costly command-and-control systems will need to be replaced with more incentive-based systems and governments will need to invest in providing long-term benefits by compensating for short-term losses.

Given the range of small-scale fisheries and management approaches, a typology of management and the research questions they raise in small-scale fisheries is provided as Appendix A.

One important factor governing the choice of management approach will clearly be value for money from any adopted management regime. A major research initiative therefore needs to be applied to estimating the costs and benefits of different forms of fisheries management in the context of small-scale fisheries. Costs and benefits with respect to both the social and economic dimensions will be required. Simply communicable outcomes in relation to major policy goals will be preferable to definitively quantified systems. Even in subsistence fisheries, it will be necessary to demonstrate convincingly that reducing the number of fishers could result in an increase in the amount of fish available for food. This appears counterintuitive to most, and it is difficult to argue against the commonly held view that an increase in catch and food share will result if there are more fishers with more efficient gear.

There is a general lack of understanding of the effectiveness of all of the alternative approaches, but this could be gained through trial and error, given sufficient time. One practical approach⁵ to speed up this learning process is to set up of a series of demonstration case studies in which one of the alternative approaches (i.e. the ecosystem approach to fisheries) can be tested. Collectively, the outcomes can be used to develop a tool kit of science and management measures including rapid appraisal techniques, participatory research and data gathering, conflict resolution tools, integrated resource management training resources, community-based and co-management approaches, governance and institutional regimes, methods for monitoring and evaluation of management performance and feedback.

⁵ The approach recommended by the ACFR and endorsed by COFI for small-scale fisheries.

3.3.2 How are the International Plans of Action on capacity and illegal, unregulated and unreported fishing best implemented in small-scale fisheries?

The Johannesburg Plan of Action, a key outcome of the WSSD, states that the FAO International Plans of Action (IPOA) to prevent, deter and eliminate IUU fishing needs to be put into effect by 2004 and that the IPOA on the management of fishing capacity should be implemented by 2005. To date, the main focus of the IPOAs has been on large-scale commercial fisheries, though many of the objectives and required actions apply across all types of fishing. Implementing these IPOAs in small-scale fisheries will require some form of customization to the small-scale fisheries context. For example, because many of the vessels engaged in small-scale fisheries do not come under a license scheme, the term “illegal” is not particularly relevant. The issue of unregulated fishing and unreported catch (see Box 5) is widespread and should be central to the development of national plans of action and policies.

It is now widely recognized that the capacity (of both labour and capital) in small-scale fisheries is excessive and needs to be reduced, though the resulting social impacts may also be unacceptable. Fishing capacity in small-scale fisheries is much more malleable (with small, simple boats, specific gears, and migratory or seasonal labour) than in industrial fisheries, and these differences must be accounted for in overall definitions and guidelines.

Box 5: Integrating the goals of international agreements into management for small-scale fisheries

Many international policy documents, including the Code of Conduct for Responsible Fisheries and its International Plans of Action (IPOAs), advocate a reduction in fishing effort and capacity to increase the yield from the resources and gain improved economic and social benefits. Should the development focus all be directed towards finding ways to remove excess fishers and vessels from small-scale fisheries? Are there other interventions that could be more successful, especially if they include capacity building and handover of processes to existing institutions?

The FAO Technical Guidelines on Fisheries Management and the Ecosystem Approach to Fisheries supplement (FAO, 1997; FAO, 2003) recognizing that these sorts of decisions and trade-offs are difficult to make at the higher policy level, recommends that the best approach to the paradox of competing objectives is to adopt a participatory approach to translate the higher level policy goals into operational objectives at the fishery level and resolve conflict with the stakeholders in terms of how the fishery can best contribute to sustainable development at the level of management interventions. This recommendation needs to be explored in the context of small-scale fisheries.

The second issue in implementing the IPOAs will be to foresee and examine the knock-on effects and impact on the small-scale fisheries sub-sector of actions implemented in large-scale fisheries. In theory, implementing the IPOAs should reduce the pressure on the world’s fish stocks. However, if left to market forces, the open access nature of many fisheries could result in any benefits being quickly eroded by the displacement of large-scale fisheries to the detriment of the small-scale sub-sector.

Research implications

In terms of the direct impact of implementing the IPOAs in small-scale fisheries, policy analyses are urgently needed to determine how the reduction of capacity and IUU fishing would impact on the socio-economic conditions of small-scale fisheries. It will also be necessary

to understand the indirect effects of removing IUU and capacity in the large-scale fisheries on small-scale fisheries. The distributional pathways of the intended benefits will need to be understood and the costs and benefits more fully analyzed.

3.4 Post-harvest issues and trade

The decentralized nature of small-scale fisheries tends to create conditions for extensive post-harvest activities. These provide substantial employment and household food security (locally, regionally and internationally). They also aid the retention of resource rent by fishing communities (including the poor) rather than it being sequestered in the hands of a few intermediaries, within or outside communities.

A significant number of women are involved in small-scale fisheries activities, (e.g. in China women account for 26.3 percent of the rural labour force in fisheries) and their role is often different from that of men. In some societies, women are involved in processing and marketing, catching and gathering for household nutrition (on a year-round basis as opposed to seasonal inputs from men) and, increasingly, in fishing as the number of single parent households increases. There is clearly an opportunity to assist women's well-being and development needs in many developing countries through a renewed research support for the post-harvest chain.

The globalization of trade (and market access-related phenomena such as food and safety concerns and environmental labeling) create both opportunities and risks for small-scale fisheries and in some cases move decision-making beyond the immediate reach of small fishing communities or fish workers.

Such considerations lead to three major sub-issues and research questions:

3.4.1 Are there means of improving post-harvest processes and trade to increase livelihoods and equitable distribution of benefits from small-scale fisheries?

One way of realizing the full potential of artisanal fishing locally is to ensure a stability of supply. This is a function of availability of the resources, as well as security of access rights. Demand for specific types of fish now comes from both local and more global nodes. Interregional trade patterns are becoming important and present new opportunities for the small-scale fisheries sub-sector (for example, in the provision of high quality smoked products versus lower value products). This trend (and to ensure the capture of the benefits by small-scale fish workers and communities) calls for increased investment in the post-harvest sector itself. Similarly, the new opportunities in the regional and interregional trade cannot be fully realized by local communities if extraneous charges (hidden costs, illegal charges) are in place, or if formal taxation systems are not transparent and harmonized. Improved and consolidated taxation systems could, on the other hand, support local government and the decentralization process.

Research implications

Attention should be given to the potential trade-offs between supporting export-oriented activities versus meeting local or regional demand. These trade-offs could have beneficial as well as detrimental effects on local populations. It seems increasingly evident that free trade ideals may not necessarily provide the solution to poverty alleviation. A set of policies is required to promote different alternatives along the axis from local/national/regional/ to international trade including the possibly of increasing the negotiating capacity of local communities and countries.

This corresponds to a major conceptual shift in the understanding of the post-harvest sector *per se*, to the broader field of trade, including the policies and institutions framing it. Because market failures are more likely to be seen in developing countries (especially the small-scale fisheries sub-sector) special attention should be given to the limit of traditional economic tools and instruments for the regulation of such markets.

3.4.2 What technological advances might augment the efficiency of small-scale fisheries and their management?

Providing technological advances in fishing gear and fishing vessels has been one of the major goals of development aid policies in the past. The introduction of technological improvements in fishing, without a better understanding of their impacts on limited natural resources, is now being questioned. In contrast, technological advances at the post-harvest stage, which enhance the value of the product or the working conditions of the fishers, remain desirable and should be encouraged based on better research and knowledge. For example, improved efficiency in small-scale fisheries post-harvest systems, marketing and the promotion of exports of products from small-scale fisheries could provide greater returns on the existing level of catch. Food quality and food safety, both in terms of its impact on price as well the risks for human health, will continue to be a major issue and one that will increase in complexity as markets, especially export markets, expand.

Research implications

A range of post-harvest technological research for more cost-effective solutions is needed, as well as research on the impacts and implications of post-harvest practices on the environment. Market research focusing on more efficient post-harvest processing, value-adding and distribution of products would be useful. Although much has been done in developing techniques for converting fish into products for agriculture and fish feeds, research could address ways in which this can either be improved or implemented in ways to support rural poverty and food security. Research into alternative ways of utilizing the catch is still needed.

3.4.3 What will be the impacts of globalization and increased fish trade on small-scale fisheries?

Although globalization and increased fish trade is lauded by some as having many benefits for national and global economies, it is also well known that inequities exist in terms of those likely to benefit from liberalized trade rules. One point of view is that liberalization of market access will lead to greater global competition which will in turn cause national companies to become more efficient. The corollary is that institutions judged inefficient by these criteria of economic competition will be urged to reform.

In contrast, some see globalization as part of a process by which the industrialized countries will exercise trade advantages over less developed economies. Liberalization of market access, trade and investment has allowed goods from industrial countries to enter into and take over a significant portion of the markets of developing countries, or to alter demand scenarios. Many warn of the dangers to social imperatives in the eventuality of private sector interests replacing the decision-making of the individual state. Depending on its ultimate means of implementation, the benefits and losses from globalization could be very unevenly spread. It will be necessary to examine the specific effects on small-scale fisheries in developing countries to determine the “winners” and “losers”.

Research implications

The effects of different possible scenarios on small-scale fisheries warrants concerted research to assist analyses, leading relatively rapidly to appropriate policy adjustments. Better information on distribution pathways and market trends for fish products may assist policy decision-makers in capturing the benefits for all sectors of the economy and shield small-scale fisheries from adverse impacts.

The issue of distribution of wealth is central to this issue and needs to be addressed. Other possible research topics include the extent to which international protocols and agreements place at risk or protect the rights of the small-scale fisheries sub-sector, and how agreements/protocols may be reformed to address their concerns and vulnerability. It is also interesting to ask to what extent these agreements/protocols are complied with by different fisheries sectors (and the subsequent costs of non-compliance). Finally, how does the sub-sector feed into the processes and agreements of these international and regional policies?

3.5 Information systems for small-scale fisheries

For any Fisheries Information System (FIS), there are a number of key attributes associated with the information it contains for the system to be both effective and efficient. These include information needs, data collection, data and information management, data analysis, and information dissemination and use. For small-scale fisheries the *information* requirements must cover harvesting and catches, processing, marketing, the fishing community and other sectors. Table 2 identifies the major information needs and requirements. Such approaches would need to be embedded in the planning cycle of the DOF or responsible management entity. It should be noted that this scheme does not address the analysis of the data and the communication of research and other outcomes, which are also key issues.

Collecting data and information is costly and time consuming. How, where and when this is done are all critical issues that must be addressed when designing a collection programme. Data collection is usually undertaken for one of three reasons: to establish a baseline, to assess trends or to address a specific information gap through research.

Baselines are either one-off studies or are undertaken at intervals spanning one to ten years. They are expensive and are usually designed to establish the exact magnitude of national fisheries. Trend analysis to monitor the impacts of policy and management decisions and their impacts on the fishery can be collected either directly or indirectly. For instance, data on total catches can be determined directly by recording the actual catches made by fishers, usually using a frame-based sampling programme. Indirect methods of recording catch require additional information (e.g. recording landings at designated sites requires information on catch retained for personnel consumption or on discards; recording flows of products through markets will require information on product conversion ratios for processed fish and on where the product was derived from to avoid “double counting” of a product passing through a succession of markets; household surveys that record fish consumption will require information on the type and proportion of the catch retained and of the volume by species sold).

The more spatially and temporally diverse and complex the small-scale fishery is, the more unlikely that direct measurements will be cost effective and hence appropriate. Indirect strategies will inevitably require a degree of stakeholder participation to enable the information that is collected to be extrapolated.

Table 2: Identifying the questions that need to be addressed in acquiring information about small-scale fisheries

	Questions
Needs	<ul style="list-style-type: none"> • What are the information needs at the different levels (macro, meso, micro), under different management approaches? How are these needs communicated and linked? • How does the information system serve to describe the value and social importance of small-scale fisheries?
Process	<ul style="list-style-type: none"> • How do you integrate data from different sources (biological, economic, social), different sectors, different time and spatial scales and different frequencies of collection? • How do you ensure feedback to the source group from the ‘processor’ and ‘user’ (e.g. macro to micro levels)? • How do you handle (process and store) qualitative data as it moves from micro to macro levels? • How do you disassociate it from the person? • How do you introduce it to policy and institutional memory? • How do you turn qualitative data to quantitative data, or data useful to policy? • What is the best technique for moving information? How do you move it without moving people? • What is the link between ‘statistical’ systems and research project data? • How do you ensure continuity in the collection of small-scale fisheries data? • How do the different information sources get ‘weighted’ in the use of the data and what is the impact of this? • What are the limitations of information systems?
Input	<ul style="list-style-type: none"> • What is the reliability of the data and how do you verify and ensure this? • What are the ‘barriers’ to people providing data or reliable data? • What are the constraints to data collection – confidentiality, legal? • How do you capture qualitative and traditional/indigenous knowledge? • What are the appropriate data collection techniques for small-scale fisheries? • Can you design and implement one information system? • What information systems/data collection is already in place and how can we modify these for fisheries? • Who collects what sort of data? e.g. how do you adapt national census data to support fisheries? • How do you disaggregate data with respect to gender? • How do we go back and retrieve and use old data?

Source: ACFR Working Party.

Research studies address specific gaps in the information base. Detailed information may be needed to support management decision-making based on research into the social and economic circumstances of the fishers and their families, and to define details of the biology and ecology of the resource base, marketing patterns or conservation needs.

Data are of little use unless they are analyzed. Training to provide analytical skills is expensive and the human capacity to undertake such work is often limited. When identifying information needs, recognition of how and by whom they are to be analyzed must be considered.

Many national, regional and international institutes generate information relevant to fisheries management decision-making, often generated as a result of regularly commissioned research or through outputs derived from externally funded projects. Much of this information has been

deposited within the formal information systems of the world's libraries that can contribute to knowledge outside of the particular geographic area where the information was generated. Re-use of such information provided in the literature may make valuable contributions when there are gaps in the local knowledge base.

The other thematic areas (3.1 to 3.4) confronting small-scale fisheries have all pointed out the need for general and specific aspects of research and information. It has previously been noted that single species approaches to assessing fisheries yields are inappropriate for most small-scale fisheries, particularly those from complex tropical ecosystems. Decentralized fisheries management approaches bring with them special requirements in identification and monitoring fisheries at the local level. Alternative approaches need to be developed and tested through their application within fisheries co-management. This section highlights three of the key information issues in more detail, including issues relating to the implementation of co-management.

3.5.1 Scoping the contribution of small-scale fisheries to poverty reduction and food security

As an urgent priority, most developing countries need to undertake a rapid assessment to establish the importance of their small-scale fisheries. An initial desk-top assessment using available secondary information, including that collected by donor funded projects, should be undertaken. This will provide initial best estimates of the magnitude of the fisheries. This review will also identify the need and appropriateness of undertaking further baseline (and other studies) that will feed into the studies identified below.

Linked to the above study is an urgent requirement to also review the context and importance attached to small-scale fisheries in NPRS and other medium-term national planning documents. Based on the correlation between the desk-top study and the coverage in planning documents, a strategy for the dissemination of synthesised information and influencing policy may need to be developed to increase the profile of the sub-sector.

3.5.2 What are the requirements for designing responsive fisheries information systems?

Donors and agencies seeking to support and maintain the benefits from small-scale fisheries should work with DOF to review their FIS (in the broader context as an element of the national information system) and define the key elements of the FIS that must be revised to produce a system that supports national poverty reduction objectives.

Similarly, collaborative work with the DOF should be undertaken to define socio-economic and biophysical indicators for monitoring local government plans and implementation, to build on existing data collection and analysis processes, and to cost-effectively monitor impacts. Linkages should be established with central planning authorities, as they have the responsibility for coordinating much of these monitoring activities.

In developing the key elements of a revised FIS, work with DOF will be required to:

- define the costs and benefits of different elements of a future strategy in order to prioritise key areas for intervention. This cost and benefit analysis should be done in terms of the costs to DOF, local government and communities of generating and using information, compared with the benefits derived from policy-related impacts;

- provide assistance, where necessary, with the redesign of collection, management, analysis, and dissemination stages of the system to monitor the impact of policy;
- develop protocols for these different elements of the FIS to ensure the wide distribution, understanding and uptake of the information amongst decision-makers;
- define and provide training required by staff at different levels of the system to implement the different elements of FIS. Training may also be needed in the use of the specific guidelines identified below;
- develop sector-specific guidelines for development planning, service delivery and the formulation of local legislation that can translate policies into understandable media for different user groups at the community, district, region and national levels. In particular these should include guidelines of socio-economic development, socio-economic impact monitoring, co-management approaches, and systematic ways of assessing and developing alternative livelihood options for the poor; and
- develop in conjunction with FIS stakeholders an informing and influencing strategy to define the information requirements and packaging of the target audience of the FIS.

3.5.3 Helping to define the information requirements in support of co-management

Even for countries with well-developed local government reform programmes, there is often a need to translate this into a coherent and strategic sector approach to facilitate the development of small-scale fisheries co-management. In consultation with stakeholders, an initial inventory of fisheries, their subdivisions into management units and the arrangements that will be suitable for their co-management must be defined. These consultations will need to take account of local administrative boundaries and constraints.

With the development of an initial inventory, consideration can then be given to the decision-making requirements and their information needs. These must be clearly defined and responsibility for their provision allocated amongst the co-management stakeholders. The information requirements must include indicators of poverty, coherent with monitoring the achievement of sectoral policy in addressing national objectives.

Cost should not exceed the benefits derived from this co-management intervention. The above inventory process will allow such a cost-benefit analysis to be undertaken and may provide invaluable insights into developing an appropriate management framework supported by FIS.

3.5.4 Developing practical communication strategies

It will also be important to design communication strategies that identify the target audience, tailor messages and define media strategies to reach the intended target audience. The following could be considered as elements for a more elaborated communication plan:

- Informative workshops aimed at facilitating the exchange of information between planners and fisheries stakeholders. This would in particular address the current lack of *representativeness* of the fishery sector in the PRSP process.
- Organization and coordination of Fisheries Forums at different levels (local, district, national and international) to foster stakeholder participation in the decision-making process and institutional development of the fisheries sector and more fully appreciate their importance.

- Working with the fisheries departments as key message carriers through to Ministers.
- Influencing the major donor agencies (in particular the World Bank – due to its large influence on national policies) to ensure that small-scale fisheries are part of their own agenda (e.g. World Bank Green Books).
- Considering the potential role of ‘pressure groups’ (e.g. International NGOs, civil society, World Forums) in influencing the agenda setting and the policy process of national governments.

4. RESEARCH PRIORITIES TO ACHIEVE THE VISION

The issues confronting small-scale fisheries and their research implications in each of the major themes affecting small-scale fisheries have been described in Section 3. This section addresses the major points within each of the same five themes and summarizes, using examples, research questions to be posed.

4.1 Research on policy, legislation, governance and institutional arrangements

Policy is the starting point that sets out the broad objectives and framework to guide relevant decisions, actions and institutional arrangements impacting on small-scale fisheries. It should be recognized that policy is required to address many, often competing, objectives that relate to the conservation and sustainable use of resources, and to economic and social (equity) needs. The main issue is that policy is often poorly articulated both within and outside of the fisheries sector, and this, plus ineffectual institutional arrangements to implement it, often results in the lack of an appropriate framework to guide fisheries management.

In this section, the major areas for research to improve policies and performance of the small-scale fisheries sub-sector are considered in relation to policies *per se*, but also with respect to institutions and organizations, and processes or instruments of direct relevance to the small-scale fisheries sub-sector:

Policies

- relevance of development policies to small-scale fisheries (and vice versa);
- relationship of the small-scale fisheries sub-sector to other (particularly industrial, large commercial) fisheries sub-sectors in policy formulation and implementation;
- impact of other sector policies;
- relative importance of formal and informal policy; and
- linkage between policy and legislation.

Institutions and organizations

- structure of small-scale fisheries sub-sector;
- structure and functions of Fisheries Departments and relevant research institutes; and
- regional fisheries management organizations.

Processes or instruments

- trade-offs between policy objectives;
- process of policy implementation;
- involvement of fishers;
- awareness of policy-makers to the mainstreaming of gender and diversity issues;
- strengthening mechanism of local governance (in a changing environment);
- relation to international planning process;

- incentives (e.g. subsidies);
- indebtedness and profitability; and
- access to micro-credit.

4.2 Research to elucidate the contribution, relevance and importance of small-scale fisheries to national economy and livelihoods

The major issues under this research theme are outlined in Section 3. Research to address these issues recognized: (i) the potential of the sub-sector (including post-harvest and small-scale fish trading activities) in rural and national economic development, (ii) their potential for equity and redistribution (both at national and local levels), (iii) the need to design valuation and communication strategies relating to the importance of small-scale fisheries, and (iv) other social and environmental benefits that could result from a more ‘healthy’ small-scale sub-sector.

In particular:

- measuring the value of small-scale fisheries (determining how to measure the values of small-scale fisheries e.g. net income, social support function, and making and communicating such assessments);
- understanding poverty;
- livelihood analysis (interactions with and between other sectors – including inland water fisheries and terrestrial-based pursuits);
- transboundary context of migratory fishers;
- understanding linkages between urban dynamics and small-scale fisheries; and
- alternative income generating opportunities.

4.3 Research on the management approaches to small-scale fisheries

There are many approaches to management of small-scale fisheries ranging from the “modernization” paradigm (introduced after the second-world war), through to more recent participatory methods, such as co-management associated with the move to decentralization of government functions. It should also be recognized that the manager of a small-scale fishery has a large and diverse number of tools (including allocation, economic and social tools) that can be utilized, but with little guidance on what may be appropriate and effective. There is a continuing requirement to monitor and evaluate progress against fisheries management objectives and the crucial role of MCS in small-scale fisheries is highlighted.

To address these issues, research is required to address; (i) higher level/overarching approaches and concepts, (ii) fisheries management approaches, (iii) management tools, (iv) monitoring and evaluation of management approaches, and (v) MCS. The major research issues are given as follows (for more detailed questions relating to management types, see Appendix A):

- governance in small-scale fisheries;
- access arrangements and property rights;
- role of traditional management systems;
- role of different management institutions (including traditional management systems);
- lesson learned in collaboration with other sectors;

- management models;
- traditional, collaboration, self-management;
- participatory/co-management approach;
- ecosystem approach;
- indicator based approach;
- effects of IPOAs (IUU and Capacity) on small-scale fisheries;
- management mechanism for low data requirements;
- how to generate necessary information for management;
- level of investment in management in relation to value of small-scale fisheries;
- fishing gear advancement;
- enhancement of resources;
- mobilization, collective action and management of communities;
- inter-sectoral approach; and
- donors development policy.

4.4 Research on post-harvest issues and trade

Both intra-regional and international trade is becoming increasingly important to small-scale fisheries. The decentralized nature of small-scale fisheries could result in substantial employment generation, and household food security as well as retention of resource rents by fishing communities. This calls for increased investment in post-harvest activities to benefit from the new opportunities. New research is required to inform decisions on potential trade-offs e.g. between export-orientated versus local or regional demand. An analysis of potential trade impacts must be undertaken if the potential benefits from global trade are to be realized, or existing benefits preserved.

Since the research topics seek to identify what may be gained or lost from post-harvest chains and increased global trade, they mirror, in part, the research activities designed to identify the contribution, role and importance of small-scale fisheries. They are:

- gender issues/better understanding of women's role;
- post-harvest loss assessment – assess the efficiency of current practices;
- value added to the products – assess the means of adding value to current practices;
- packaging and marketing;
- standards and tariffs;
- indirect taxations;
- risk assessment (food safety);
- linkage between harvesters and consumers;
- congruence of scale (micro versus macro operation) – assess the economic, power and efficiency issues in conducting post-harvest processes at different scales;
- intra-regional trade; and
- effects of globalization.

4.5 Research and required action to develop information systems for small-scale fisheries

While not exactly a research theme in its own right (although there are many research aspects) the development of a Fisheries Information System (FIS) warrants separate attention, as this is both a critical component in bridging the gap between research and action, and provides an effective framework for identifying needs of various information users (ranging from informing policy decision-makers right through to implementing technology for individual fishers, processors and marketers).

The FIS provides the context for examining the needs, processes, inputs and outputs of different user groups in a hierarchical structure that covers the macro-, meso-, and micro-scales and the linkages between them (both in aggregating data and information upwards for use at higher levels in the hierarchy and downwards in terms of providing feedback, especially to the suppliers of the data). A range of issues are identified, especially in relation to integrating qualitative and quantitative data, techniques to improve information flow, collecting and using traditional knowledge, linkages between levels in the hierarchy and the need to review and make existing data and information accessible.

- review and evaluation of existing information;
- data requirements (identification of needs and efficient and cost effective means for its collection);
- information on the fishing community;
- gender disaggregated data;
- mobilize indigenous knowledge and local ecological knowledge;
- transforming data and knowledge into information; and
- research on the research process.

5. BRIDGING THE GAP BETWEEN RESEARCH AND ACTION

This research agenda has been developed to assist researchers construct new approaches for the evaluation and management of small-scale fisheries. To achieve impact, the more traditional biotechnical approaches of many fisheries agencies must be augmented by substantial contributions from socio-economic research.

In many cases DOFs are structured and staffed with an emphasis on northern hemisphere approaches to stock assessment. Whilst resource assessment and monitoring remain key functions, the emphasis of the research agenda presented here is on policy formulation and socio-economic research. This means working in a participatory way with individuals, fisher groups, communities and assorted management entities. Research will involve conducting livelihood analyses, and analyses of policy processes and effects. Many national fisheries bodies, particularly in developing countries, are not currently well equipped to undertake such research. To fully engage with the demands of the research agenda, there will have to be a substantial shift in the approaches espoused by national fisheries authorities (and by policy-makers). However, fashioning linkages to other centers of expertise in these issues will be key steps in addressing the research agenda. These include, for example, universities, ministries of planning, international organizations experienced in community and co-management approaches, and regional management bodies – in which experiences, expertise and approaches to research and management issues for small-scale fisheries can be shared.

For the research agenda to have its full effect, an enabling environment for its conduct, and the sharing of results, must be fostered. Incentives are required to ensure that stakeholders become involved in fisheries research. It also requires, for instance, that policy-makers be receptive to the needs and requirements of small-scale and not just industrial fisheries. However, interactions will not be confined to the fisheries sector, but also with other aspects of national and local planning (e.g. development, agricultural labour policy, water and coastal use etc.) which will require increased liaison and sharing of information.

Research will be important to inform policies that contribute to sustainable small-scale fisheries, and should play an important role in empowerment, advocacy, and mobilization of resources. The number and types of end users of research is large and will include policy-makers, donor organizations, fishers and fish workers, and civil society organizations.

Bridging the gap between research and action may be largely achieved by including more stakeholders in research, especially the end users in the form of fishers and fish workers. This would make it more demand-led and increase ownership, and ensure that results are more likely to be fed back to the end users.

Research and communication go hand-in-hand and there is a need for the development of effective communication techniques so that research results can be well presented in a way that is easily understood by the target audience. In the presentation of research the implications should be clearly explained: good research may not result in good actions for political reasons unless the benefits and implications are clearly explained.

The timing requirements of research are very important. Good research to really understand complex realities takes considerable time, whereas the market demand for research may require much quicker delivery. Researchers need to adapt their research to better suit market needs as well as managing the expectations of the end users. A case in point will be the need to quickly establish the effects of globalization of trade on small-scale fisheries.

Research will be aided by effective horizontal consultation and co-ordination amongst institutions, stakeholders and civil society organizations. In this regard, research will be most effective if it is imbedded in a review and planning process, and this should help to solve some of the problems of bridging the gap between researchers and users of the information by making research more action-orientated.

In many settings, human capacity is insufficient, and must be considered as a crucial and long-term requirement to improve the linkages between research and action⁶. Staff retention and incentives are important issues, and donor-funded research programmes should include aspects of capacity-building.

The importance of funding for research and support services is evident but must be clearly stated to ensure support for a global approach to small-scale fisheries in concert with the development community. The co-management approach promoted in this brief is a good way to begin to mobilize structured support and to conduct research collaboratively between fishers and fish workers, national departments of fisheries, development donors and other stakeholders.

More cognizance of small-scale fisheries will result from their explicit rather than implicit inclusion in international and national instruments governing fisheries. Draft guidelines for small-scale fisheries are to be prepared by FAO for inclusion into the Code of Conduct for Responsible Fisheries. Such guidelines should consider the special importance of small-scale fisheries to small island developing states. Valuation and assessments of small-scale fisheries will ensure their incorporation in international efforts to establish systems of economic and environmental accounting for fisheries, and hence augment the profile of this critically important fisheries sub-sector.

⁶ See Macfadyen and Huntington (2003) for a fuller description of capacity building requirements.

REFERENCES

- Béné, C.** 2003a. Contribution of small-scale fisheries to rural livelihoods in a water multi-use context (with particular emphasis on the role of fishing as “last resort activity” for the poor). AFRCR/WP/SSF/I/3 32 pp.
- Béné, C.** 2003b. When fishing rhymes with poverty: a first step beyond the old paradigm on poverty in small-scale fisheries. *World Development* 31: 949-975.
- Coates, D.** 2002. Inland capture fishery statistics of South East Asia: Current status and information needs. Asia Pacific Fishery Commission, Bangkok, Thailand. Regional Office for Asia and the Pacific publication 2002/11. 114 pp.
- Cocrane, K.L.** In press. What should we care about when attempting to reconcile fisheries with conservation? Keynote address to the World Fisheries Congress, Vancouver, May 2004.
- FAO** 1999. Indicators for sustainable development of marine capture fisheries. FAO Technical Guidelines for Responsible Fisheries No. 8. 68 pp.
- Macfadyen, G. & Corcoran, E.** 2002. Literature review of studies on poverty in fishing communities and of lessons learned in using the sustainable livelihoods approach in poverty alleviation strategies and projects. FAO Fisheries Circular 979. 93 pp.
- Macfadyen, G. & Huntington, T.** 2003. Human Capacity Building in Fisheries. Final Draft Report 146-FAO/R/01/A. 81 pp.
- Neiland, A.E.** 2002. Fisheries development, poverty alleviation and small-scale fisheries: a review of policy and performance in developing countries since 1950 *In: Small-scale fisheries, poverty and the code of conduct for responsible fisheries. Report of an international workshop organized by CEMERE as part of the DFID/FAO Sustainable Fisheries Livelihoods Programme (SFLP), Cotonou, Benin, November 2001, FAO Rome.*
- Satia, B.** 2003. Promoting the ecosystem approach to fisheries in the context of small-scale fisheries. AFRCR/WP/SSF/I/6. 18 pp.

Appendix A. An evaluation of the types and levels of fisheries management and the associated research relevant to small-scale fisheries

‘Aspect’ of management	Types	Research questions
Higher level/ overarching approaches and concepts ⁷	Sustainable livelihoods approach Ecosystem approach Ecosystem approach for fisheries Multi-sectoral approaches Inter-sectoral approaches Transboundary or regional approaches	<ul style="list-style-type: none"> • What are the strengths and weaknesses of these overarching approaches (case studies, comparative studies and pilot projects) with respect to small-scale fisheries? • How does the current organizational structure, at international, regional, national and local levels, influence the effectiveness of these approaches? What alternative structures could improve the effectiveness of these approaches?
Fisheries management approaches ⁸	<ul style="list-style-type: none"> • Conventional marine approach (stock assessment based, top-down approach) • Traditional/indigenous approach • Co-management approach (including self-management) • Centralized • Decentralized • Rights-based approach 	<ul style="list-style-type: none"> • What approaches have and are currently working in small-scale fisheries, why and where? <ul style="list-style-type: none"> • What are the appropriate management objectives for small-scale fisheries? Including a review of existing management plans? • What are the conditions for success or failure of different approaches to small-scale fisheries? • What are the transaction costs and benefits (social, biological and economic) of different approaches? • How can we transfer and adapt approaches across small-scale fisheries? • What types of innovations in approaches are occurring, or should occur in small-scale fisheries? • What are the indigenous/traditional approaches in small-scale fisheries? • What are the lessons from other sectors? • What planning processes are applicable or effective under the different approaches? • What are the roles of the stakeholders and organizations in different approaches and how do they link? • Are there fundamental differences between the approaches and their effectiveness in the different habitat types (marine coastal/offshore, large freshwater bodies and small water bodies)?

Source: ACFR Working Party on small-scale fisheries.

^{7, 8} Note: These are not all mutually exclusive; approaches could be combinations of some of these.

‘Aspect’ of management	Types	Research questions
<p>Tools – Implementation (social, biological, economic)</p> <p><i>Note: this list is not exhaustive</i></p>	<p>Social tools</p> <ul style="list-style-type: none"> ● Participatory Rural Appraisal ● Facilitation ● Communication/awareness ● Mediation/conflict resolution ● Social incentives ● Capacity building (training leaders) ● Gender focused tools <p>Economic tools</p> <ul style="list-style-type: none"> ● Investment ● Buy-out ● Compensation ● Credit ● Subsidies ● Post-harvest marketing ● Taxation <p>Allocation tools</p> <ul style="list-style-type: none"> ● Rights-based (transferable quotas, individual quotas, territorial use rights etc.) ● Zonation – closures (temporal, spatial) ● Protected Areas ● Access limitation ● Registration/licensing ● Output controls (e.g. catch limits) ● Input controls (e.g. gear, vessels) ● Habitat alteration and rehabilitation (e.g. artificial reefs, replanting riparian vegetation) ● Restocking ● Stock enhancement 	<ul style="list-style-type: none"> ● Which tools work and which do not work and what are their strengths and weaknesses in small-scale fisheries? ● What are the appropriate conditions for application of different tools in small-scale fisheries? ● Which tools are appropriate when resources are overexploited in small-scale fisheries? ● What are the transaction costs and benefits of the different tools in small-scale fisheries? ● Is there a link between the types of tools and the type of approach in small-scale fisheries? ● What is the social, economic and biological impact of using different types tools in small-scale fisheries? ● How long do tools take to show impacts? ● What gears or improvement in gears is appropriate for small-scale fisheries (responsible fishing gear – e.g. by-catch reduction, eco-friendly)? ● How much fishery resource is there to allocate and what are its boundaries? <ul style="list-style-type: none"> ● What are the alternative (low cost) methods for resource assessment (e.g. indicators)? ● What are the key issues relating to allocation? <ul style="list-style-type: none"> ● Who currently gets the allocation, between and within sectors? ● What are the alternative/competing uses of the resource or habitat within and outside the fisheries sector (e.g. ecotourism, game-fishing, hydropower, aquaculture, agriculture)? ● To whom does ‘society’ want to give the allocation, what are the allocation rules and criteria, how is this decided? ● How do you allocate when the resources are already overexploited? ● What types of monitoring and evaluation are appropriate for small-scale fisheries? What low data monitoring methods are appropriate for small-scale fisheries?

‘Aspect’ of management	Types	Research questions
		<ul style="list-style-type: none"> • What are the appropriate tools for capacity building, training and increasing awareness in small-scale fisheries? • What are the different dimensions of capacity that need to be built? • What can be learnt from other sectors (e.g. agriculture, forestry sector)? How can these be modified for the fishery sector? • Are different tools more effective for different groups of communities or stakeholders, e.g. with gender, with social strata, with scale, with culture? • What are the issues of inter-generational transfer (e.g. mentoring, apprenticeship)?
Monitoring and evaluation of the management approach (are objectives being met?)	<ul style="list-style-type: none"> • Indicators • Low cost, simple assessment, low data approaches 	<ul style="list-style-type: none"> • What types of social, economic and biological indicators are appropriate for small-scale fisheries and how do the indicators link to the management objectives? • What are the types of monitoring and evaluation processes used in small-scale fisheries? Which ones work and why?
Monitoring, Control and Surveillance (MCS) at all levels, in order to ensure your rules and regulations are followed ⁹ .	<ul style="list-style-type: none"> • Community based (e.g. peer-pressure) • Conventional enforcement (e.g. coast guard, police) • Technology based (e.g. Vessel Monitoring Systems) 	<ul style="list-style-type: none"> • How is MCS done in most small-scale fisheries, from the traditional/indigenous methods to conventional ‘enforcement’? • How do approaches to MSC at local and national levels link or interact? • What are the most applicable MCS arrangements for small-scale fisheries under the different management approaches and tools? <ul style="list-style-type: none"> • What are the appropriate conditions for application of different MCS in small-scale fisheries? • What are the transaction costs and benefits of the different MCS in small-scale fisheries? • Is there a link between the types of tools and the type of MCS in small-scale fisheries? • What is the social, economic and biological impact of using different MCS tools in small-scale fisheries?

⁹ These are not necessarily mutually exclusive.

Appendix B. Pertinent information on tools and techniques that could be used in assessing vulnerability and poverty in small-scale fisheries communities

Tools and Techniques	Objectives	Participants	Methods	Strengths	Weaknesses
Literature Search	Obtain secondary information	Libraries and institutions	Search and consultations	Provides perspectives of the situation	Information may be very general
Timelines	Historical view of important events	Groups of elders, youths and women	Group discussion, interviews and feed back	Expedient summary of events (positive and negatives), helps identify medium and long-term solutions to problems	Exercise too long and complex, sensitive issues may be raised
Brainstorming	Gives multiple ideas on issues, problems and solutions	Groups of elders, youths and women	Questions and responses on specific issue and summarize results	Facilitates participation in the idea building process, stimulates people to think, generates ideas and solutions, useful introduction to structured and focus group discussion	May result in conflicts and uneasiness in group and limit value of results
Venn Diagramme	Identify institutions and their activities as well as relationships	Socio-professional groups	Semi-structured interviews	Easy to use, provides stakeholders opinion on institutions and identifies conflict situations	Group may be informal, difficult to appreciate relationships
Seasonal Calendars	Chronology of activities and preferred livelihoods strategies	Socio-professional groups	Semi-structured interviews	Encourages a holistic approach, easy to implement	Brings to surface conflicts between individual and collective strategies
Trend Analysis	Assess changes over time	Informants, elders, youths and women	In-depth discussion of specific issues or phenomena	Creates awareness of potential positive and negative trends, improves quantity and quality of information, permits comparison of trends	Relies on memory, tool is complex, local people may loose interest in the subject
SWOT Analysis	Assess issue of concern, interventions or services; self-evaluation	Groups of elders, youths and women	Structured brainstorming	Stresses different sides of an issue, promotes group creativeness, issue discussed in detail, strengths and weaknesses easy to elicit	Opportunities and threats more difficult to elicit, sensitive topics and differences of opinion may arise, tendency by few to dominate
Validation and Feed back	Validate and synthesize information	All groups	Summarization, discussion and agreement	Consensus reached, encourages community attachment to subject	Minority view may be lost

Source: Satia (2003).

Tools and Techniques	Objectives	Participants	Methods	Strengths	Weaknesses
Poverty Profiling	Characterization, localization, numeration and description of groups of poor people	All groups of poor	Search, semi-structured interviews	Analytical instruments directly linked to action, provides answers to why people are poor, formulates actions to reduce poverty	Relies on memory, brings to surface conflicts between individual and collective strategies, some topics too sensitive