



NEPAD

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Fish for All

Inland Fisheries in Africa

Key Issues and Future Investment Opportunities for Sustainable Development

Technical Review Paper – Inland Fisheries

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By

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ABSTRACT

The purpose of this paper is to provide an overview of the current understanding of issues affecting inland fisheries in Africa – a sub-sector which presently helps to underpin the livelihoods and food security of thousands of people. African inland fisheries have the potential to contribute even further to pro-poor growth and poverty reduction through a number of routes including local enterprise development and regional and international trade. The paper will be used to inform the process by which strategic investments for inland fisheries development in Africa will be decided in the future through the facilitation of the New Partnership for African Development (NEPAD).

There are five sections to the paper: First, an introduction to inland fisheries in Africa and their importance for future investment. Second, an outline of the approach and methodology used for the review is given. Third, a general profile of inland fisheries in Africa is presented, identifying and describing major characteristics. Fourth, the major issues affecting inland fisheries in Africa and their likely future impact are identified and analysed – a series of illustrative case-studies is included.

Finally, a fifth section identifies a number of investment possibilities for the future in the following five areas:

(i) Information, analysis and knowledge including the identification of new national and regional research programmes with a high utility value for fishery managers (research and management systems are clearly and explicitly linked to one another); the development of cost-effective and pragmatic fisheries information systems to support decision-makers; and capacity-building in fisheries systems analysis to enable fishery decision-makers to use a broad range of concepts and approaches in their planning and operational activities;

(ii) The policy process including support for the strategic assessment of national and regional policy frameworks and processes leading to the clarification of the full range of policy options available for fisheries; and the establishment of a policy advisory programme and unit in each country/region to guide future policy development and implementation based on a lesson-learning and best-practice approach, and involving a wide range of actors at different levels of society;

(iii) Fisheries management systems including support for a comprehensive strategic analysis of inland fisheries management in each country and region in order to identify future options and alternatives, including new approaches such as wealth-based fisheries management; capacity building and investment to enable the development of a series of appropriate management plans for inland fisheries based on the results of the strategic analysis and linked to specific and agreed development goals and outcomes; and the establishment of a series of Fisheries Management Projects on all major inland fisheries to implement the proposed plans;

(iv) Fiscal frameworks and investment strategies including support for institutional reforms to underpin fiscal reforms which will allow government to utilise wealth generated by well-managed inland fisheries effectively for development activities; policy, institutional and legal reform is also required to encourage private investment in inland fisheries and the full participation of private sector actors in the development process; and support for investments in infrastructure and legal and financial systems which facilitate access to assets and markets by a broad range of actors within inland fisheries, leading to economic diversification and economic growth (pro-poor);

(v) Networks, partnerships and coalitions including mechanisms at different levels – local fisheries fora, partnership programmes at national levels and international networks – to encourage different actors within inland fisheries to work together within a fisheries development process to identify problems and constraints, and to seek appropriate and workable solutions which lead to ‘Win-Win’ outcomes over time for all of those involved.

One of the main findings of this review is that while inland fisheries have significant potential to contribute to sustainable development in Africa in the future, this potential is currently threatened by the weak performance of the associated fisheries policy and fisheries management systems. Through appropriate and timely investments to address these weaknesses in the present, the future benefits from well-managed fisheries for people in Africa will be ensured.

Key words:

Africa; Inland Fisheries; Fisheries development; Fisheries Management; Investment opportunities

ABBREVIATIONS

| | |
|----------|---|
| ASFA | Aquatic Science and Fisheries Abstracts |
| CCRF | FAO Code of Conduct for Responsible Fisheries |
| CIFA | FAO Committee for Inland Fisheries in Africa |
| DAC | Development Assistance Committee (OECD) |
| DC | Developing Country |
| DFID | United Kingdom Department for International Development |
| DFR | Department of Fisheries Resources (Uganda) |
| DRC | Democratic Republic of Congo |
| FAO | UN Food and Agriculture Organisation |
| FIMS | Fisheries Information Monitoring System |
| FishStat | FAO Fishery Statistics system |
| FOREX | Foreign Exchange |
| GDP | Gross Domestic Product |
| GEF | Global Environment Facility |
| GRP | Glass Reinforced Plastic (boats) |
| GT | Gross Tonnage |
| GTZ | German Development Agency |
| ICBT | Informal Cross Border Trade |
| IGO | Inter Government Organisation |
| ILM | DFID/GoU Integrated Lake Management project |
| LIFDC | Low Income Food Deficit Countries |
| LVFO | Lake Victoria Fisheries Organisation |
| MDG | Millennium Development Goal |
| MEY | Maximum Economic Yield |
| MSY | Maximum Sustainable Yield |
| NEPAD | New Partnership for Africa Development |
| NGO | Non Government Organisation |
| OA | Open Access |
| OECD | Organisation for Economic Cooperation and Development |
| PRSP | Poverty Reduction Strategy Paper |
| REC | Regional Economic Community |
| RoU | Republic of Uganda |
| SADC | Southern African Development Community |
| SAP | Strategic Action Programme or Plan |
| SFLP | DFID/FAO Sustainable Fisheries Livelihoods Programme |
| SLA | Sustainable Livelihoods Approach |
| SOFIA | FAO State of Fisheries and Aquaculture Report |
| WCED | World Commission on the Environment and Development |
| WFC | WorldFish Center |

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1.0. INTRODUCTION AND OBJECTIVES

Throughout Africa, the occurrence of a large number of inland or freshwater lakes, rivers and other aquatic habitats such as swamps and floodplains, of different sizes and forms, and containing a wide variety of fish populations, have provided mankind with the opportunity to exploit fish for food, income and livelihoods in general for many centuries. Fish, fishing and fisheries are an integral part of the culture and economy of many peoples and countries in Africa, with significant historical linkages which provide an important back-drop to more recent fisheries development programmes pursued by national governments. For example, in Egypt, there are many ancient carvings which show fishing in the River Nile. Today, Egypt has the largest inland fisheries production in Africa (293,000 tonnes) (FAO, 2003) In Nigeria and other countries of the Lake Chad Basin, archaeological research has revealed that the local economy over 2,000 years ago centred on an integrated system of farming and fishing on the influent rivers and floodplains. Today, the Lake Chad Basin produces over 100,000 tonnes of fish valued at US\$50 million and contributes to the livelihoods of thousands of people (Neiland, 2005). In eastern and southern Africa, the Great Lakes of the Rift Valley have long supported riparian fishing communities, and today the fisheries remain an important part of national economies. For example, in Uganda, the fisheries of Africa's largest water body, Lake Victoria, together with Lake Kyoga and other smaller lakes, currently yield over 200,000 tonnes of fish and underpin annual international fish exports worth US\$ 100 million (Republic of Uganda, 2004). For Malawi, another Great Lake, Lake Malawi, represents an important part of the economy (FAO, 2003).

Overall, today, it is estimated that the inland fisheries of Africa produce 2.1 million tonnes of fish, which represents 24% of the total global production from inland waters (FAO, 2004). In comparison to marine fisheries, inland fisheries production is relatively small, representing only 6% of global production. In Africa, marine fisheries production (4.7 million tonnes) is also much larger compared to inland fisheries (2.1 million tonnes). However, this simple comparison of gross production between marine and inland fisheries can be misleading, for it can be shown that inland fisheries in Africa generate a wide variety of benefits (such as income and food) and underpin the livelihoods of millions of people. This is the case in many countries because inland fisheries are diverse and widely distributed, they can be exploited quite easily using simple technologies, and are often well-integrated with farming and other economic activities. In other words, inland fisheries are a valuable and an integral component of the lives of many people throughout Africa, and have an important contribution to make to sustainable development, including economic growth and poverty reduction.

However, there are concerns that inland fisheries in Africa are increasingly under threat from factors such as environmental change (both man-made and natural) and overexploitation (due to over-fishing). There is also widespread recognition at all levels of society and government that measures need to be taken to safeguard the flow of benefits from inland fisheries. An important first step must be for all stakeholders to build a common and strategic understanding of the importance of inland fisheries for Africa,

and to reach a consensus on how to address the main challenges through various strategic investments.

The primary objective of this paper is therefore to provide an overview of the current understanding of issues affecting inland fisheries in Africa (Box 1). The paper will be used to inform the process by which strategic investments for inland fisheries development in Africa will be decided in the future through the facilitation of NEPAD.

Box 1: Review of African Inland Fisheries – Objectives

- To provide an overview of the current understanding of issues affecting inland fisheries in Africa;
- To inform the process by which strategic investments for inland fisheries development in Africa will be decided in the future through the facilitation of NEPAD;

There are four sections to the paper as follows: the first section gives a brief outline of the general approach and methodology which the paper has used; the second section presents a general profile of the characteristics of inland fisheries in Africa; the third section identifies and describes the major issues which currently affect inland fisheries in Africa, and considers their future impact; in addition, a series of case-studies are presented to illustrate the key issues and the approaches used by development initiatives and programmes to address them; the fourth section, identifies future directions for investments in inland fisheries, including priorities for research and capacity-building in support of these investment areas.

2.0. GENERAL APPROACH AND SPECIFIC METHODOLOGY

The general approach and the specific methodology which were used to prepare this review of inland fisheries in Africa are summarised in Box 2, and explained below.

Box 2: Summary of General Approach and Specific Methodology

General Approach – main components:

- Expert team and regional experience;
- Information Sources (international and national; formal and grey);
- Key concepts and theoretical frameworks reviewed;
- Development interventions: Empirical evidence, lesson-learning, best-practice;
- Criteria for identifying and prioritising development interventions;

Specific Methodology:

- Define characteristics of inland fisheries in Africa (profile);
- Determine importance of inland fisheries in Africa for development;
- Identify and analyse major issues affecting inland fisheries in Africa;
- Identify and assess past and current development interventions (case-studies);
- Identify future development interventions and investments;

2.1. General approach

The general approach to the review was underpinned by five inter-related components, as follows:

2.1.1. Expert team and regional experience

A team of five professionals (the co-authors) was commissioned by the WorldFish Center (WFC) to prepare the review paper. The study team members drew upon their experiences of fisheries policy, fisheries management and fisheries research in different regions of Africa to contribute to the overall process of identification and analysis of key issues and future opportunities for fisheries development.

2.1.2. Information sources

The review has drawn upon and used a wide variety of information sources, including both the formal national and international literature, and also various forms of grey literature such as project reports and unpublished papers. For the international literature, bibliographic searches were undertaken through online information bases (e.g. <http://www.fao.org/fi/asfa/asfa.asp>), with further documents accessed through the FAO/OneFish network (<http://www.onefish.org>). FAO reports and papers were also collated and reviewed (principally FAO SOFIA and CIFA documents). At the regional and national levels, the co-authors sourced and used relevant documents. It should be noted, however, that the literature on fisheries in Africa is relatively large and dispersed, and therefore the current review does not claim to be comprehensive (although the authors have tried to cover key issues) – a major problem is the significant amount of relevant information (re: fisheries development policy and initiatives) which is available only in the grey literature.

2.1.3. Key concepts and theoretical frameworks

It was recognised early-on in the preparation of the review paper that inland fisheries in Africa – and the contribution which they can make to sustainable development – can be reviewed and analysed from a range of different perspectives (they are no different to other types of fisheries in this sense). These perspectives are, in turn, underpinned by a range of particular concepts and theoretical frameworks covering important areas such as the nature of the policy process and policy analysis, fisheries development and poverty reduction, fisheries management systems, and governance and fisheries governance. In order to provide a sound basis for the review paper, a brief review of the major themes and ideas within each of these areas was undertaken, with a focus on key definitions. The main themes are listed in Box 4 below and shown in more detail in Appendix 1.

Box 4: Fisheries Development – key concepts and theory

- Fisheries development and poverty;
- Policy process and policy context;
- Governance and fisheries governance;
- Fisheries management systems;
- Fisheries valuation

The first theme - fisheries development and poverty - focuses on the contribution or role which fisheries can make to development. This is an important entry-point for subsequent analysis and discussion. Early approaches to fisheries development adopted expansionist and modernist policies with the aim of maximising fisheries production, mainly through the introduction of new technology. It was assumed this would lead to an increase in the welfare of fishers and a reduction of poverty. However, the weak performance of this approach (and the current high level of poverty among fishing communities) has led to a re-examination of the role of fisheries in development in many parts of the world. It is also increasingly recognised that there are different benefit pathways – for example, direct benefits derived from involvement in fishing, and also in-direct benefits derived by non-fishers from the re-distribution of wealth by government generated within a fisheries through taxation. The choice of benefit pathway is clearly an important policy decision.

The second and third themes – policy process and policy context – focus on a better understanding of fisheries policy in general. The concept of the policy process emphasises that this consists of two parts – policy-making and policy implementation. Through research into the characteristics and performance of the policy process, combined with a good knowledge of the impact of the policy context, it should be possible to identify ways and means by which fisheries policy overall can be improved. In the case of fisheries development policy, for example, if the contribution which fisheries make to poverty reduction (through either direct or in-direct means) can be increased in the future, this would represent a good indicator of improved policy performance.

The fourth theme – governance – is a key feature of the policy context. Under conditions of ‘good governance’ in a particular country, the policy process will operate effectively to achieve a high level of policy performance (e.g. the achievement of specific policy goals). The definition of good governance is problematic, but it should acknowledge the importance of effective interaction between both public and private actors, participating in processes and institutions, to solve societal problems. The fifth theme – fisheries governance – is an extension of this concept, and for many developing countries, the idea of establishing some form of co-management arrangements for fisheries represents a major thrust of current research and development activity in this area; in other words, fisheries governance can be improved through a new management arrangement which is focused on sharing power and responsibility between government and fishing communities.

The sixth theme – fisheries management systems – highlights that conceptualisations of fisheries systems in general have progressed from a relatively simple fisheries science-based approach to a more sophisticated and all-embracing systems approach, involving both multi-disciplinary information (e.g. natural sciences plus social sciences) and cross-sectoral features (e.g. fisheries interacting with water resources and agriculture systems). This has resulted in a widespread recognition of the limitations of fisheries science-based approaches to provide fisheries management advice, and the need for further research and development to design and implement appropriate fisheries management systems in the future. The importance of effective fisheries management systems for the future cannot be overemphasised. Fisheries management systems represent the mechanism by which fisheries policy is implemented (i.e. policy objectives are translated into tangible outcomes). There is overwhelming empirical evidence to show that unmanaged fisheries cannot provide a sound basis for sustainable development.

The sixth theme – fisheries valuation – is critical to fisheries development policy. It can be seen as an important starting point for the whole policy process since putting a value on a fishery is also a way of expressing its importance or significance to a region or a country. Although there are comparatively few formal valuations of inland fisheries in Africa (or elsewhere), there are a variety of alternative ways in which the importance of fisheries may be expressed. Clearly, the way in which this information is communicated to policy-makers, or used within the policy process, can have a great influence on the policies which directly or indirectly impact on fisheries. Undoubtedly, if the value (or importance) of a fisheries sector is not known or overlooked, the possibility for that sector to make an effective contribution to an economy or development process will also be reduced.

Finally, this sub-section has shown that there are a range of important concepts and theoretical frameworks which need to be considered in reviewing inland fisheries in Africa. They provide a basis for analysis, for understanding and for new insights. However, because there are a range of new perspectives offered, in an increasing multi-disciplinary fashion, it is important to understand the inter-relationships between these concepts, theories and approaches. One of the most effective ways of linking the concepts and theories is to focus on a central idea – the importance of appropriate fisheries management – as emphasised earlier (above). In this context, and as a starting point for further consideration of the nature of fisheries management, the range of components which make up an effective fisheries management system is given by FAO in the definition shown in Box 3.

Box 3. Fisheries management defined (FAO, 1997)

The integrated process of information-gathering, analysis, planning, consultation decision-making, allocation of resources and formulation and implementation, with enforcement as necessary, of regulations or rules which govern fisheries activities in order to ensure the continued productivity of the resources and accomplishment of other fisheries objectives

2.1.4. Development interventions: Empirical evidence, lesson-learning and best-practice

In addition to the perspectives on African inland fisheries which can be provided by both conceptual and theoretical studies and analysis (above), and reported in both the formal and the grey literature, it was also considered important to deal with the empirical evidence relating to development interventions in this sector. One of the main reasons is that future investment and development strategies, put in place by both national governments, international organisations and others, may be able to learn lessons from past and current experiences, and in the end establish, and work towards, best practice guidelines.

It should be recognised that over the past 50 years there have been a significant number of national and international programmes focusing on fisheries development. For example, during the period 1974-85, bi-lateral and multi-lateral development agencies expended a total of US\$3.73 billion in support of fisheries in DCs (Bailey, 1988). This does not include the funding provided internally by national governments to local fisheries administrations. However, the outcome or impact of this investment (in terms of achievement of projects goals and contribution to development) shows a high degree of variation within and between countries across the world. In the end, some fisheries development interventions or projects are more successful than others. But what factors determine success in these situations? After 50 years of development interventions in the fisheries sector, some of the reasons are starting to emerge, but the process of post-project evaluation, lesson-learning and re-design of new projects based on this information is both complicated and takes time. Some of the complication arises because the results of project evaluations are not always made available by the organisations responsible. A number of useful evaluations of fisheries development programmes are available (e.g. World Bank, 1984; Allsopp, 1985; Ahmed, 1999; Neiland, 2004), and it is important for this process to continue into the future.

As part of the current review, it was decided to identify a number of case-studies of inland fisheries development interventions throughout Africa, both past and current, and to examine what important lessons, if any, could be derived from them for the future.

2.1.5. Criteria for identifying and prioritising fisheries development interventions

In reviewing the literature on African inland fisheries, and the current and past experiences of development interventions, it is also appropriate to consider the types of criteria which might be used, in general, to prioritise some types of project rather than others. Clearly, the detail of the prioritisation process will vary from one country to another (depending on local needs and opportunities and the working of the policy process), but it is possible to define some of the basic criteria, as shown in Box 4. In the list, the first four criteria ([I] to [iv]) relate to the need to justify an investment in fisheries (as opposed to other sectors), while the other criteria relate to fisheries project identification, justification, feasibility and impact.

The list of criteria can be used in at least three ways – as a checklist of key issues which need to be considered in identifying fisheries development projects; as a framework to make an *ex-ante* assessment of a set of project options (as part of a selection process); and also as a framework to make an *ex-post* evaluation of a fisheries development project which has been implemented (part of performance assessment). In all three cases, the measurement of the individual criterion, comparison between criteria and the sources of information to underpin the methodology would need careful consideration and validation.

Appendix 2 gives a summary of a recent exercise which was undertaken to compare a range of fisheries development policies and interventions in different parts of the world, based on a set of case-studies, and including some examples from Africa, using some of the criteria shown in Box 4.

| Box 4: Criteria for identifying and prioritising fisheries development interventions | |
|---|--|
| (i) | National context (I): Fisheries contribution to GDP? (relative to other sectors?) |
| (ii) | National context (II): Fisheries contribution employment, income and food supply? (is the sector an important source of activity-based benefits and livelihoods?) |
| (iii) | Strengths/opportunities: which sectoral attributes represent strengths and opportunities for investment? |
| (iv) | Threats/weaknesses: what threats does the sector face, and are there specific weaknesses that need to be addressed? |
| (v) | Past experiences/lessons: What fisheries development interventions have taken place in the past and what level of performance did they achieve? |
| (vi) | Technical feasibility: how difficult is it to assess, justify and plan the proposed project? |
| (vii) | Implementation: How difficult is it to implement the proposed project and what is the likely cost? |
| (viii) | Short-term poverty alleviation benefits: will the project help to raise the standard of living of fishers and other members of society in the short-term? |
| (ix) | Long-term poverty alleviation benefits: will the project help to raise the standard of living of fishers and other members of society in the long-term? |
| (x) | Equity: will the benefits of projects be distributed equitably within fisher communities and/or within society as a whole? |
| (xi) | Sustainability: will the project generate a sustainable outcome in the long-run? |

2.2. Specific methodology – 5 steps

The general approach to the review of African inland fisheries, with particular reference to opportunities for investment in sustainable development, therefore, includes a wide range of perspectives and considerations as explained above. In order to utilise these effectively, the following specific methodology was adopted consisting of 5 steps as shown in Box 5:

Box 5: Review of African Inland Fisheries: Specific approach – 5 steps

Step 1: Characteristics of inland fisheries

- Using both formal and informal sources of information develop a profile of African inland fisheries identifying and describing the important characteristics and trends;

Step 2: Importance of inland fisheries for sustainable development

- Describe and analyse the contribution and role of inland fisheries for sustainable development in Africa, including both in-direct and activity-based flows of benefits;

Step 3: Major issues for African inland fisheries

- Identify and assess the opportunities and constraints for inland fisheries and their contribution to sustainable development now and in the future; use appropriate case-studies for illustration and for presentation of empirical evidence;

Step 4: Fisheries development interventions – past and present

- Identify and analyse the approaches and activities which have been used – past and present – to address the opportunities and constraints to fisheries development; use appropriate case-studies for illustration and for presentation of empirical evidence

Step 5: Fisheries development interventions and investments for the future

- Identify and justify appropriate fisheries development interventions for the future, drawing upon new understanding (concepts and theory), past and recent experience, and the use of decision-making criteria;

3. CHARACTERISATION OF AFRICAN INLAND FISHERIES

3.1. Introduction

In this section, the main characteristics of inland fisheries in Africa will be identified and examined based on a search of the international literature (both formal and grey). The findings of this work have been organised into a framework consisting of five domains – Environment, Technology and Sector Structure, Economics, Social Aspects, and Policy and Management – as shown in Appendix 3 (Table 1) below.

The development of this framework represents a starting point for the identification of important issues affecting the inland fisheries sector. It was intended to focus on each of the domains initially, and then, to also identify possible cross-cutting and inter-sectoral issues, which might also be important for future interventions to promote fisheries development.

As shown in Appendix 3 (Table 1) each of the domains is subdivided into a number of sub-sections (summarised in Box 5 below). Each sub-section starts with a ‘Global overview’ (What are the features/issues on a global scale?) and then focuses on ‘Africa’ (what are the features/issues for African inland fisheries?).

Box 5: Framework: Profile of Inland Fisheries in Africa

1. Environment
 - 1.1. Ecosystems
 - 1.2. Fisheries Resources
2. Technology and Sector Structure
 - 2.1. Types of Fisheries
 - 2.2. Fishing Fleets
3. Economics
 - 3.1. Fisheries Production
 - 3.2. Fisheries Production Values
 - 3.3. Economic Values
 - 3.4. Fish Trade
 - 3.5. Fish Supply and Consumption
 - 3.6. GDP Contribution
4. Social Aspects
 - 4.1. Employment and Livelihoods
 - 4.2. Nutrition
 - 4.3. Socio-Economics, Poverty and Food Security
5. Policy and Management
 - 5.1. General Global Trends
 - 5.2. Fisheries Policy
 - 5.3. Fisheries Management

3.2. Environment

In the first domain of the Environment, there are two key elements which are used to characterise inland fisheries in Africa – (Appendix 3: 1.1.) Ecosystems and (Appendix 3. 1.2.) Fish Resources.

3.2.1. Ecosystems

From a global perspective, the importance of understanding fisheries within an ecosystem context is widely recognised (i.e. fisheries or fisheries development cannot be viewed in isolation). But despite concerns over the widespread environmental impacts of major factors such as pollution or dam construction or over-fishing, progress has been slow in developing and adopting a truly ecosystem-based approach in general, and in the fisheries sector there is still much work to be done in this area.

The inland fisheries of Africa are contained within 25 large river basins and a number of smaller ones (mainly coastal), which include and also cross a wide variety of geological and climatic zones. The river basins are also shared by different riparian states. Within the river basins are a variety of hydrological features ranging from the major rivers (e.g. Nile, Niger, Zambezi) and Lakes (e.g. Great Lakes of East Africa) down to numerous small headwater streams and seasonal lakes and ponds. These aquatic ecosystems are highly productive, and the rivers in particular show significant seasonality due to variation in rainfall, which produces a characteristic flood pulse (one or more), leading to the creation of temporary floodplains. These provide feeding and breeding habitats for

fish, and also lead to the deposition of fertile mud on the surrounding land (which is often used for agriculture during the dry season).

A number of factors have encouraged policy-makers in Africa to consider the management of major river systems – seasonal water shortages (e.g. dams for water storage); increasing agriculture productivity (e.g. dams for irrigation schemes); electricity generation (e.g. hydro-electric dams) and improved navigation (e.g. dredging rivers). All of these schemes impact on the fish stocks contained within the aquatic ecosystems, and there is great concern about the likely negative impacts (e.g. loss of habitats and loss of fish stocks) although there is not enough on-going research to make an accurate assessment of this at present.

3.2.2. Fish Resources

From a global perspective, over 50% of the world's fish stocks are either fully- or overexploited. Analysis of trends by FAO (2002) show that many marine fish stocks are in decline, inland fish stocks are under threat from environmental change and impacts, while aquaculture continues to develop and expand in many parts of the world.

The inland fisheries of Africa mainly exploit multi-species fish stocks, which are characterised by complex inter-species interactions and adaptations to a changing (seasonal) environment, including extensive migrations in some species. Fish productivity varies according to specific environment, but is generally high. The relationship between fish stock composition and productivity, and changes to the aquatic environment brought about by natural (e.g. droughts) or man-made impacts (e.g. dams) clearly is important (major changes have been observed), but knowledge and understanding is generally lacking. Excessive fishing pressure is the major factor affecting African inland fisheries at present, and in the near future, it seems highly likely that the impact of dams and other water control schemes, and pollution, will also be increasingly important. FAO (1996) states that fishing effort doubled between 1985-1996, and that most inland fisheries are intensively exploited. Finally, compared to other parts of the world, Africa has been least affected by species introductions (only 430 recorded), although there are a number of high profile (and high impact) cases including Nile Perch into Lake Victoria and Kapenta into the Zambezi River Reservoirs. Tilapia species have been widely introduced for aquaculture, but the exact impact on local stocks is not known.

Overall, for the ecosystems and fish resources which make up the inland fisheries of Africa, the general impression from the international literature is that on-going research and information flows are very localised (some fisheries have been researched, others not all), and not sufficient to enable knowledge accumulation for effective policy and management decision-making at the national and international (basin-wide) levels.

3.3. Technology and Sector Structure

In the second domain of technology and sector structure, there are two key elements used to characterise inland fisheries in Africa – (Appendix 3: 2.1.) Types of fisheries; and (Appendix 3: 2.2.) Fishing fleets.

3.3.1. Types of fisheries

From a global perspective, there are a broad range and wide diversity of fisheries types and fisheries technologies ranging from industrial, semi-industrial to non-industrial (or small-scale or artisanal). The former are characterised by high levels of capital investment, high technology and low labour inputs, compared to low levels of capital, low technology and high labour inputs for the latter. Catch utilisation varies with market demand (and access to markets), but a majority of fish goes for human consumption (in various forms), especially for more local fisheries in developing countries.

Inland fisheries in Africa are largely non-industrial (artisanal) in nature, including the sub-sectors of catching, processing, transportation, trade and gear manufacture, which are quite distinct occupations in some fisheries more than others. There are exceptions, of course, and in particular, the fishery for Nile Perch in Lake Victoria – the largest in Africa – has a modern (industrial) processing and export sub-sector, which is supplied by a predominantly artisanal fishing fleet. In parts of Africa, fishing is a part-time activity for rural people who also tend to farm, keep animals and engage in other economic activities. Fishing is often well-integrated within the overall pattern of work for rural households and communities, with well-established patterns of input and time allocation. Many inland fisheries are also a part of local culture and tradition, and based on local knowledge of fish resources and migrations, the use of a variety of different fishing technologies to suit particular fishing opportunities and seasonal changes in flood regimes, for example. Traditional technologies and practices are also applied to fish processing and fish trade – there is a well-established and extensive regional trade in smoked and dried fish, based on artisanal technology (e.g. mud smoking ovens), in many parts of Africa. It is also well-recognised that the nature of many inland fisheries in Africa is changing under the influences of modernisation, commercialisation and social pressures (e.g. population increases and cultural change). For example, some traditional fisheries – formerly imbedded in the cultural and economic life of local communities – have been captured by powerful individuals and declared as private property. The extent and impact of these forms of change on inland fisheries are not well-documented at present.

3.3.2. Fishing fleets and gears

On a global level, there are 3.8 million fishing vessels (20 million GT) and two-thirds of this fleet is un-decked and less than 10 m in length. While the total fleet size of Developed Countries is shrinking, that of Developing Countries (especially in Asia) is increasing.

For inland fisheries in Africa, the majority of fishing vessels are canoes (un-decked) with some motorisation provided by outboard engines. It is virtually impossible to determine the exact number of canoes given the dispersed and isolated nature of many fisheries. However, there is a general impression in the literature that the number of canoes and other fishing inputs (gears) is increasing. Many traditional gear designs have now incorporated modern materials (nylon, plastic), which have been imported and distributed by various governments (at subsidised prices) and also by private companies operating under licence. Overall, the upgrading and greater availability of fishing gears has contributed to increased fishing power and fishing pressure in African inland fisheries (particularly under conditions of weak management).

3.4. Economics

In the third domain of economics, there are five key elements used to characterise inland fisheries in Africa – (Appendix 3: 3.1.) Fisheries production; (Appendix 3: 3.2.) Fisheries production values; (Appendix 3: 3.3.) Economic values; (Appendix 3: 3.4.) Fish Trade; (Appendix 3: 3.5.) Fish supply and consumption; and (Appendix 3: 3.6.) GDP contribution.

3.4.1. Fisheries production

On a global scale, in 2000, capture fisheries production reached 94.8 million tonnes – the highest ever recorded – but the expected future trend sees catches decline overall (despite certain problems with estimation caused by the fluctuating nature of pelagic stocks and uncertainties over catch data from China). Developing Countries account for the largest share of production (62 million tonnes or 65% total). Total aquaculture production (46 million tonnes) is expected to continue growing. Total inland fisheries was stable at 8.7 million tonnes.

For Africa, in 2001, the total estimated landings from inland fisheries were 2.1 million tonnes, equivalent to 24% of global inland fisheries production. As a proportion of total catches in Africa (both marine and inland), inland fisheries landings have increased from <25% (1951) to 49% (1999). The countries with the highest landings were Egypt (293,000t or 3.3% total), Tanzania (274,000t or 3.1% total), Uganda (222,000t or 2.5%), followed by Congo DR, Kenya, Nigeria and Mali (>100,000t each), as shown in Fig. 1. below. The major fisheries included Lake Victoria (500,000t), the River Congo Basin (520,000t), the River Nile Basin (total catch not known), the River Niger-Benue Basin (520,000t) and the Chad Basin (100,000t). It has been estimated that total annual production increased by 2% p.a. (1984-1996), and is continuing to follow this trend (FAO indicates that there is potential to increase production from many inland waters in Africa). However, the accuracy of many of the fisheries statistics for African inland fisheries is not known and there are widespread concerns about the credibility of the current estimates (some estimates are better than others) – it should be recognised that many inland fisheries show significant fluctuations in production which are related to periodic changes and variation in flood pulses and aquatic environmental conditions. In

general, the fisheries statistics systems of many national governments in Africa are weak or non-operational.

3.4.2. Value of fisheries production

From a global perspective, in 2001, the total value (first sale) of fish landings was estimated at US\$81 billion.

For Africa, in 2001, the total value (first sale) of landings from inland fisheries was approximately US\$1,823 million (or US\$1 billion), equivalent to 2% total global value.

However, these statistics are best estimates (taking into account estimated landings and estimated average national fish prices), and must also be treated with caution. Some examples of the value (first sale) of inland fish landings by country reveal the level of wealth which is being generated – Nigeria’s landings (130,000 t/yr) are valued at US\$350 million; with the same value for Mali. Export values are more reliable (based on trade records) and for example, the value of annual exports from Lake Victoria (Nile Perch) for 1998 by country was: Tanzania (US\$200 million); Kenya (US\$80 million) and Uganda (US\$90 million).

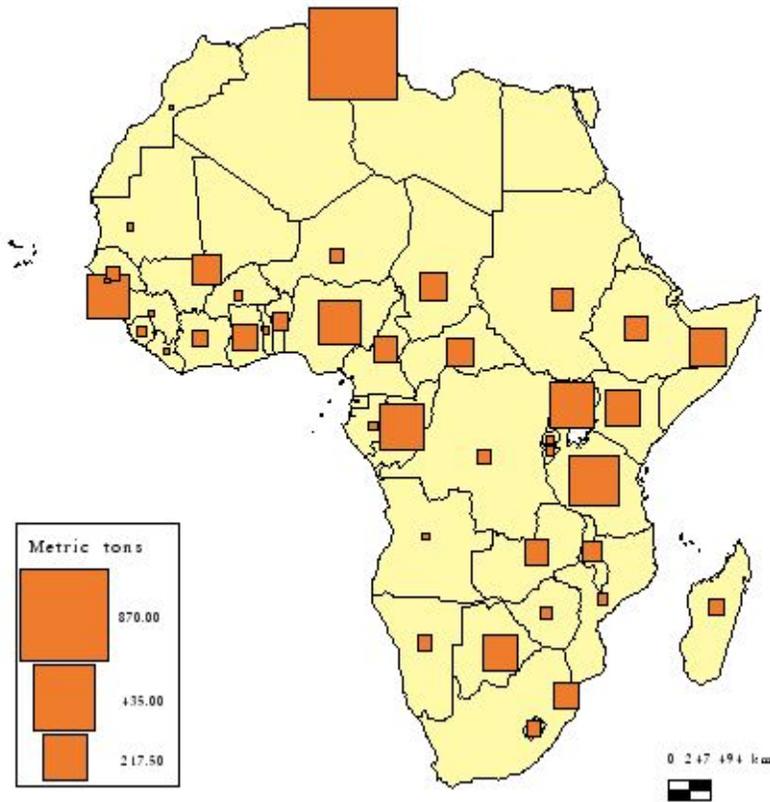
3.4.3. Economic values

The values given above – first sale values (or production multiplied by average market prices) – which are gross financial values (no costs are included) should be treated as a simple guide to the actual value of fisheries, or the wealth being generated through fisheries production. The determination of net economic values (which express the real potential contribution to the economy) requires the application of specific economic methodology. The potential wealth of a fishery can also be expressed in terms of the economic rent potential.

From a global perspective, the level of economic rent which can be generated on a sustainable basis has been determined for very few fisheries (Cunningham and Neiland, 2005). However, in terms of the national economy, the extraction (through taxation of fishers) and use of this rent (re-investment) can represent a major source of renewable capital for economic development.

For inland fisheries in Africa, there have been very few economic investigations, and it is difficult to locate real economic values in official government documentation or the international literature. For example, the economic wealth potential of the major inland fishery – Lake Victoria – has not been determined. However, the few studies which have been undertaken reveal that inland fisheries can make an important contribution to local and national economies. For example, in Northern Nigeria fisheries can generate US\$90/ha of wetlands – a figure which compares favourably with alternative usage of this land (such as converting to cereal production).

Fig. 1. Inland fisheries production by country in Africa (2002) (Source: FAO FishStat)



3.4.4. Fish trade

From a global perspective, in 2001, the global trade in fish and fishery products increased to US\$55 billion (8% increase since 1998). Fish is the most valuable agricultural product/commodity traded today. While the major markets are located in Japan, Europe and North America, the fisheries of developing countries are the major source of traded fish. Fish is the most valuable export commodity for developing countries, and an important source of foreign exchange earnings. However, there a range of emerging issues which are likely to impact on the international fish trade in the future including more stringent quality control regulations and consumer concern over the source of fish and whether it comes from well-managed stocks.

Throughout Africa, inland fisheries have become well-integrated within organised and highly commercialised trading systems which usually connect rural fisheries with urban markets. This provides an opportunity for rural fishers to earn cash for fish sold, which is often in turn re-invested in other activities such as farming. Fresh fish is usually processed by sun-drying and smoking using artisanal technology near the landing sites and then packed in boxes/sacks and transported in bulk to urban markets, sometimes

hundreds of miles away, and even across borders into other countries. However, much of this trade is informal and does not appear in national statistics or accounts. In general, while there has been some research into this trade, it has tended to focus on the transfer of new post-harvest technology. It is only in recent years that attention has focused on the economic value and livelihoods impact of the fish trade. Some fish trade systems are better known than others (e.g. the fish trade centred on the inner Delta of the River Niger and that of the Lake Chad Basin which trade about 50,000 tonnes fish p.a. with a first sale value of about US\$50 million). But it is clear that the fish trade can generate significant economic benefits and underpin the livelihoods of many thousands of rural people. A key issue is how the generation and distribution of economic benefits associated with the fish trade is controlled and by whom. The role of private entrepreneurs (rather than public organisations) appears to be crucial – providing capital investment, management and organisation skills.

Other key factors which have led to the development of the trade in dried/smoked fish from inland fisheries in Africa include the increasingly high market demand for fish from urban markets and better roads and communication infrastructure. In more remote regions, lacking good roads, the fish trade is often more local and involves greater quantities of fresh fish.

There is also an important international trade in Nile Perch from Lake Victoria, with over 500,000 tonnes of fish worth US\$600 million in export sales sent to Europe, North America, Japan and the Middle East. A number of modern fish processing factories in each of the three riparian countries are supplied by thousands of small-scale fishers. The overall operation and trade generates economic and livelihood benefits at all levels of society, but there is some concern as to how the benefits are distributed and whether they are sustainable into the future.

Overall, there appears to be a patchy knowledge of the trade and marketing associated with inland fisheries. In recent years, with a move away from technology-based studies and more focus on the nature and the impact of the trade systems themselves, there is a growing awareness of the importance of both the formal international export trade typified by the Nile Perch trade from Lake Victoria and the informal national and regional trade in artisanal dried/smoked products.

3.4.5. Fish supply and consumption

From a global perspective, the total supply of fish for food (excluding China) has been growing at a rate of 2.4% since 1961, while the human population has been growing at 1.8% p.a. The per capita supply has increased to 8.3 kg/yr for Low Income Food Deficit Countries (LIFDCs), and to 14.8 kg/yr for developing countries in general (excluding LIFDCs). Overall, the average capita supply for countries with inland capture fisheries is <2.5 kg/person, but amongst the top 20 countries for inland fisheries, there are 13 African countries including Chad, Uganda, Mali, Congo Republic, Gabon, Tanzania, Zambia, Kenya, Benin, Egypt, Central African Republic, Malawi and Congo DR, with per capita fish supply ranging from 4.5-9 kg/capita (see Appendix 3: Table 1:3.5).

For Africa, therefore, inland fisheries make an important contribution to total food supply. Although Asia has the largest total supply of inland fish, the per capita supply is more significant in Africa, and this is especially the case for landlocked countries where imports of marine fish have declined, and where aquaculture production has not developed, despite various programmes and investments in this sector.

In general, there is a lack of data and information on fish supply and consumption in Africa, and most of the estimates are based on isolated research or the work of particular development projects. It is assumed that most inland fish landings are utilised for human consumption, as opposed to industrial uses (e.g. animal feed manufacture). The extent to which local fishing households consume their own catches is also changing, especially with the increased penetration of informal fish trade networks and the opportunities this provides to sell catches for cash.

3.4.6. Gross Domestic Product contribution

From a global perspective, the average contribution of fisheries to total GDP is relatively small for most countries (<1%). The fisheries sector contributes over 5% to total GDP in Mauritania, Senegal, Madagascar, Namibia, Mali, Ghana, Chad, Seychelles, Uganda and Mozambique. The countries in Africa, where inland fisheries contribute over 5% to total GDP are Chad, Mali and Uganda. Information for many other countries is not available.

3.5. SOCIAL ASPECTS

In the fourth domain covering social aspects, there are three elements used to characterise inland fisheries in Africa – (Appendix 3: 4.1.) Employment and Livelihoods; (Appendix 3: 4.2.) Nutrition; and (Appendix 3: 4.3.) Socio-Economics, Poverty and Food Security.

3.5.1. Employment and livelihoods

From a global perspective, in 2000, there were 35 million people directly employed (both part-time and full-time) in fishing and aquaculture, compared to 28 million in 1990. This represented 2.6% of the world's agricultural workforce. The largest number of fish-workers was found in Asia (30 million), compared to Africa (2.6 million) and S. America (1 million).

In Africa, inland fisheries are an important source of employment in many countries, and this includes all the sub-sector activities such as fishing, fish processing, gear-manufacture and supply, and transportation and trade. For many rural households, activity or employment in some part of the fisheries sector is often integrated with other activities, such as farming, to provide a coherent livelihood strategy. For example, a number of recent research projects in the floodplain wetlands of the River Niger in Mali, and the lakeside wetlands of Lake Chad, have shown that households fish and farm in different seasons in a well-established activity pattern which helps to reduce risk (through livelihood diversification) within the fluctuating arid zone environment (erratic rains and floods) of these regions.

The integration of inland fisheries and farming has many dimensions. The fact that fish catches can be sold for cash in many regions (to merchant traders) certainly facilitates this integration, since rural fishing households can re-invest in farming and other activities. However, the possibility of cashing in on fishing can also create additional problems – for example, migrant fishers (and would-be fishers) can come into conflict with existing residents and communities who see the new entrants as a threat and do not wish to share their waters (or the potential benefits). Without a well-established fisheries management system (originating from traditional or modern government) to deal with types of issues, then serious conflict and social upheaval can occur.

Given the increasingly weak performance of national economies in many African countries, and the limited scope for employment, it seems possible that the fisheries sector, especially inland fisheries, will come under increasingly pressure from those seeking economic opportunities. There is certainly some evidence to show that fisheries and other common pool resources provide the safety-net for poor people, and effectively subsidise the lack of economic growth and development which is being experienced by many countries. Policy-makers will need more information about fishing livelihoods and livelihoods in general, and the associated social and economic dynamics for future planning, but at the present time, there is comparatively little information of this type (although various research and development projects across Africa are pursuing this agenda).

3.5.2. Nutrition

From a global perspective, fish is an important source of animal protein for over 1 billion people (the global average fish protein supply is 4.4g/capita/day, plus 20-30 calories/capita/day). Of course, the total amount and type of fish consumed depends on a range of factors including natural availability, food traditions, supply, demand and income.

In Africa, the average fish protein supply is 2.4 g/capita/day, which is the same for S. America, but lower than for Asia (4.8 g/capita/day). Of course, these are average figures, and take account of total fish supply (domestic production and imports). In many African countries, fish proteins are essential and critical in diets where total protein intake may be low (other forms of protein not available or too expensive). For example, fish (including both marine and inland) contributes more than 50% of total animal protein in The Gambia, Ghana, Equatorial Guinea and a number of other countries. For certain countries – Chad, Mali, Niger – almost all the fish consumed is from inland sources. However, there is relatively little comprehensive and reliable information on fish in nutrition in Africa (except for various localised projects), and the importance of inland fish, in this respect, is probably even greater given the widespread distribution and ease of access to inland fisheries in general.

3.5.3. Socio-economics, poverty and food security

From a global perspective, the socio-economic characteristics and poverty status of small-scale fisheries and fishing communities in developing countries have been represented in a particular and consistent manner for over 30 years – namely that poverty is endemic in fishing communities, that ‘fishers are the poorest of the poor’ and that ‘fishing is the activity of last resort’. Poverty has also been attributed to a lack of fishing inputs, overexploitation in unmanaged fisheries and to a lack of alternative employment. Many fisheries development policies (aimed at increasing welfare in fishing communities and reducing poverty) adopted a technology-based productionist approach to encourage greater catches, while trying to put in place a centralised management system (usually based on command and control of fishing effort and gear types). Unfortunately, the original representation of fishing communities as endemically poor (the diagnosis) and the policy response of productionist measures and centralised management (the cure) have both proved to be inappropriate and unworkable – the design and implementation of successful fisheries development approaches remains a major challenge for most countries.

In Africa, there has been an increase in socio-economic and poverty-related research on fisheries in recent years. This has helped to broaden our understanding of the nature of poverty in fishing communities, and to broaden (and in some ways re-define) the approaches which are used for fisheries development. It is clear that fisheries are capable of generating significant wealth on a sustainable basis when well-managed – however, the manner in which the fisheries are owned and controlled, and the way in which the wealth is generated and distributed will have a major impact on the socio-economic profile and poverty status of the associated communities and region. For inland fisheries, traditional community-based management systems, which were common-place, probably included a greater degree of wealth-sharing than more contemporary systems (which are often subject to elite capture and privatisation of the benefit streams). It is also recognised that poverty is a complex phenomena, and that it affects particular actors or groups when entitlement breakdown occurs (e.g. a failure to access food, commodities and services). Understanding poverty in fishing communities and the means to address it, therefore requires a good understanding of social structures, social relations and politics (all essential elements of governance), as well as patterns of change, with particular reference to entitlements

Inland fisheries are important for food security in many African countries for a number of reasons (relating mainly to supply and entitlements). First, there is a ready and year-round supply of fish because of the widespread distribution of diverse water bodies – fish can often be caught quite easily using relatively simple gears which are operated by men, women and children. Second, many water bodies and fisheries are operate as common pool resources or open access resources (where there are no restrictions at all) – this means all members of the local community can exploit the fisheries resources according to their needs (of course, in many situations, fisheries can become overexploited, or access is restricted by the enforcement of user-rights by the ‘owners’). Third, in many rural and urban areas, fish is the cheap alternative to other more expensive sources of

animal protein (meat, eggs). Fourth, fish is often available in markets because of the well-developed formal and informal fish trade in Africa. Fifth, fishing is often integrated with farming, and provides a source of food and income (to purchase food) during seasons when farm produce might not be available to eat or sell.

3.6. POLICY AND MANAGEMENT

3.6.1. General global trends

The FAO (2002) has identified that fisheries policies and management in many parts of the world, at national and regional levels, are in a state of flux, with increasing recognition of the need for appropriate resource exploitation and use to contribute to sustainable development. For inland fisheries, it is also recognised that management efforts are increasingly complicated by other activities including urbanisation, water management and control, deforestation and agricultural activities, and industrial wastes. There is a need, therefore, to develop management systems which cope with competing uses and within an ecosystem context. The fact that fisheries resources are under increasing pressure, with a build up of fishing effort, means that allocation mechanisms and conflict resolution systems will have to be put in place. Overall, there is a need to re-consider the management approaches which have been used in the past 50 years, and to learn from past experiences (both successes and failures). In the future, new approaches must cope better with multiple objectives for fisheries management, and incorporate multi-disciplinary perspectives into the policy process in order to do this. The FAO Code of Conduct for Responsible Fisheries (CCRF) adopted in 1995 seeks to facilitate change and adjustment in fisheries, and the lays the ground rules that governments should follow if long-term sustainability is to be realised. There is also an urgent need to consider whether fisheries authorities need to do things better, or in fact, to do things differently in order to achieve success in fisheries management – for example, the management of fisheries with the objective of maximising production has not worked (it encourages a race for fish and overexploitation), whereas the objective of wealth generation can be successful under the right conditions (Cunningham and Bostock, 2005).

3.6.2. Fisheries policy

For many countries in Africa, fisheries have not been a priority in terms of development policy and investment over the past 50 years, although there are some current exceptions – for example, Ghana, Malawi and Uganda highlight the importance of the sector in current Poverty Reduction Strategy Paper-type documents. In general, it can be claimed that the role and contribution of fisheries to sustainable development in most countries has been underestimated (under-valued), and the fisheries sector is often seen as a minor component of the agriculture sector.

It appears that fisheries policy has remained static in most African countries, with relatively few major revisions of policy documents established at the time of independence; however, in some countries, fisheries policy has been modified (e.g. Nigeria put in place an Inland Fisheries Decree in 1992), or at times, even radically

changed (e.g. Mali where attempts are being made to re-introduce local level management after abolishing traditional rights some time earlier, Quensiere, 1995).

National fisheries policy often has multiple objectives including resource conservation, preservation of bio-diversity, contribution to the rural economy and employment, supply of fish to domestic markets, contribution to international trade. It is clearly difficult to integrate and achieve all of these, especially since trade-offs may be involved.

The policy process (design and implementation of policy) itself is usually founded on decision-making mechanisms operating at higher government levels and controlled by government officials and politicians, often with minimal interaction or consultation with local level organisations or actors. In addition, the underlying policy narrative usually focuses on fisheries production maximisation as the way to meet policy objectives, often with little consideration of alternative narratives relating to economic or social perspectives. The central policy of production maximisation has been supported in many countries by other policies and instruments to encourage modernisation and expansion of fishing operations through, for example, the mechanisation of fishing operations, supply of new types of gears and other fishing technologies, loan schemes and cheap credit for fishermen, and construction of harbours and post-harvest facilities.

In general, the international literature indicates that policy performance for inland fisheries in Africa has been weak, with a failure to meet many of the objectives set originally. There are, of course, some success stories, but they appear to be in the minority – for example, the development of the Nile Perch fishery in Lake Victoria has met certain policy objectives for the riparian countries involved such as generating export revenues.

By evaluating the policy process for inland fisheries, it can be seen that a major constraint has been the gradual weakening and decline of the relevant government organisations (e.g. Fisheries Departments), characterised by a limited capacity to meet their mandate and responsibilities. This situation has been further compounded in many countries by a weak and often inappropriate legal system. Ultimately, these problems can be attributed to a lack of political support for the sector, and a resultant lack of investment (or in some cases, agreed re-current funding allocations are not met, leading to funding shortfalls and interruptions to policy implementation).

It should also be noted that the possibilities for improved fisheries policy development have also been constrained by the prevailing weak institutional setting in many countries (which is especially complicated for the major and shared hydrological basins such as the River Nile Basin, the River Niger Basin, Lake Tanganyika and others); the stagnation of policy around a narrowly-focused science-based and technological approach; and a failure to clarify the linkages (and coherence) between fisheries policy and sustainable development (e.g. the value and role of fisheries, the potential and ability to generate sustainable wealth, and the possible contribution to pro-poor growth).

3.6.3. Fisheries management

In most countries in Africa, fisheries management is the responsibility of a State fisheries department, which is often part of a larger national administration covering natural resources, agriculture and/or rural development. The department which is mandated to implement national fisheries policy is usually underpinned by a legal framework, and often contributes information and advice on the further development of policy and the relevant laws. The fisheries department is normally allocated a budget (from the national exchequer) to carry out its functions including information-gathering and monitoring, analysis and planning, resource allocation, setting and enforcement of rules and regulations, and general administration of all aspects of the fisheries sector.

Fisheries management systems and the associated government administration in Africa usually have a centralised organisation (as in many parts of the world) with an overall Director of Fisheries controlling regional and local officers, who enact and enforce fisheries regulations on the ground, and in turn feedback information to help decision-making at the centre. This system is also termed 'command and control' and 'top-down and centralised' in the literature.

For many years, the objectives of State fisheries management systems have focused almost exclusively on the maximisation of fisheries production (or fish landings) with reference to a maximum sustainable yield (MSY) and the control of fishing effort. In many fisheries, State fisheries departments have attempted to operate licensing schemes, both as way of controlling the numbers of fishers, and also as a means of collecting revenue. In most cases, the funds must be passed to the national exchequer (via the Ministry of Finance), whereas in some others, the funds are retained by the fisheries department to fund their operations and/or local fishery projects.

In general, the literature indicates that the national fisheries management systems, which have been applied to inland fisheries over the past 40 years in Africa have not performed well. Indicators show that fish stocks are increasingly threatened by overexploitation, fishing pressure is increasing and many fisheries operate under conditions of free and open-access (OA) *de facto*. There are various reasons for this – lack of funding and political support, lack of staff, low levels of expertise, and logistical and technical problems (as indicated above).

At the same time, in some parts of Africa (e.g. Malawi, Chad Basin) fisheries have been shown to operate effectively under the control of traditional community-based management systems. However, even these systems can become less effective as fishing pressure and demands for access to fishing resources from outsiders increases beyond the control of local management systems, and as certain actors decide to privatise certain parts of the fishery in response to commercial opportunities (selling fish or fishing rights for private profit).

More recently, the weak performance of State fisheries management systems has led to an increased search for alternative approaches to fisheries management for inland

fisheries in Africa. One of the main thrust now is for community-based or co-management arrangements – to try to capitalise on the knowledge, and the needs and capacities of fishery stakeholders to manage fisheries at local level in partnership with State authorities. However, despite over 10 years of experience in attempting to design and implement these systems (usually under the instigation of, and with funding from, external agencies, donors and NGOs), the performance of co-management arrangements varies from fishery to fishery (both successes and failures have been recorded), and there is clearly much more to understand about the process involved. One of the certainties is that it will take ‘time’ to establish new and workable alternatives to purely State-operated or traditional fisheries management systems.

There are also other perspectives on the future pathway for fisheries management in developing countries. As indicated above, one suggestion is a need to re-consider the objectives of fisheries policy, and to re-orient with a clear focus on wealth generation and the potential contribution of fisheries to pro-poor growth. Fisheries could then be viewed within a broader development policy – one which emphasises economic growth for poverty reduction – which could also be compatible with a livelihoods approach, since greater and effective wealth generation and distribution from natural resources such as fisheries would open up livelihood opportunities for all rural actors. In the next section, some of these relationships will be explored in brief.

4. THE IMPORTANCE OF INLAND FISHERIES FOR SUSTAINABLE DEVELOPMENT AND PRO-POOR GROWTH

4.1. Introduction

In this brief section, the results of the characterisation of inland fisheries in Africa (above) will be used to explore the relationship between natural resources (inland fisheries) and sustainable development.

4.2. The importance of inland fisheries – basic parameters

To summarise the findings of the characterisation exercise (above) in terms of the importance of inland fisheries in Africa for sustainable development a range of basic parameters are given in Box 5 below:

| Box 5: The importance of inland fisheries in Africa – a summary of basic parameters | |
|---|--------------------------|
| Parameter | Indicative value |
| PRODUCTION | |
| • Total inland production (% global total) | 2.1 million tonnes (24%) |
| • Total inland production as proportion of total fisheries production | 49% |
| • Rate of increase of annual inland fisheries production | 2% |
| • Total no. African countries with inland production >100,000t/yr | 7 |
| VALUE | |
| • Total first sale value of inland fisheries production (% global value) | US\$1.82 billion (2%) |
| • Total economic value of inland fisheries production | Not known |
| EXPORTS | |
| • Total volume/value of inland fisheries exports (international) (% global total) | c. US\$650 million (1%) |
| • Total volume/value of inland fisheries exports (regional) | Not known |
| FISH SUPPLY | |
| • No. African countries with inland fish supply >4kg/capita | 13 |
| • No. African countries in top 20 for global inland fish supply | 13 |
| GDP | |
| • GDP contribution of inland fisheries (mean) | <1% |
| • Total no. African countries with GDP contribution >1% | 5 |
| EMPLOYMENT | |
| • Total employment in African fisheries (% global) | 2.6 million (7%) |
| • Total employment in African inland fisheries | Not known |
| • No. part-time fishers | significant |
| NUTRITION | |
| • Fish protein supply in Africa, average (global average) | 2.4g/capita/day (4.4) |
| • No. African countries where fish >50% total animal protein supply | 7 |
| • No. African countries supplied by inland fisheries >50% per capita fish supply | 16 |

Source: Indicative values have been extracted from the Section 3. Characterisation of African Inland Fisheries (above)

4.3. Sustainable Development and Pro-Poor Growth

While the table of indicative values for inland fisheries (above) provides a useful snapshot of the role and importance of this natural resources sector for countries in Africa, it is also important to consider the overall process of development and the relationship between the fisheries sector and other sectors, and the affect of policy decisions on flows of benefits and the impact on the poor.

The term ‘sustainable development’ was first defined in 1987 by the World Commission on the Environment and Development (WCED) as ‘..development that satisfies the needs of the present without compromising the capacity of future generations to meet theirs’. (the concept has three pillars – economic development, social equity and protection of the environment). The difficulty has been to put in place both policies and mechanisms that contribute to this goal. A wide range of development approaches have been used over the past 50 years throughout the world, some more successful than others. However, poverty still remains a problem and a fact of life for over 1 billion people.

In the past 5 years, international development attention has focused on the achievement of the Millennium Development Goals (MDG) and one of the main mechanisms under consideration by the international community is ‘pro-poor growth’, as defined in Box 6 below:

Box 6: Pro-poor growth defined

DFID (2004a/b) in two recent briefing sheets define pro-poor growth (the absolute definition) as

‘...the average growth rate of the incomes of poor people’ (p.1).

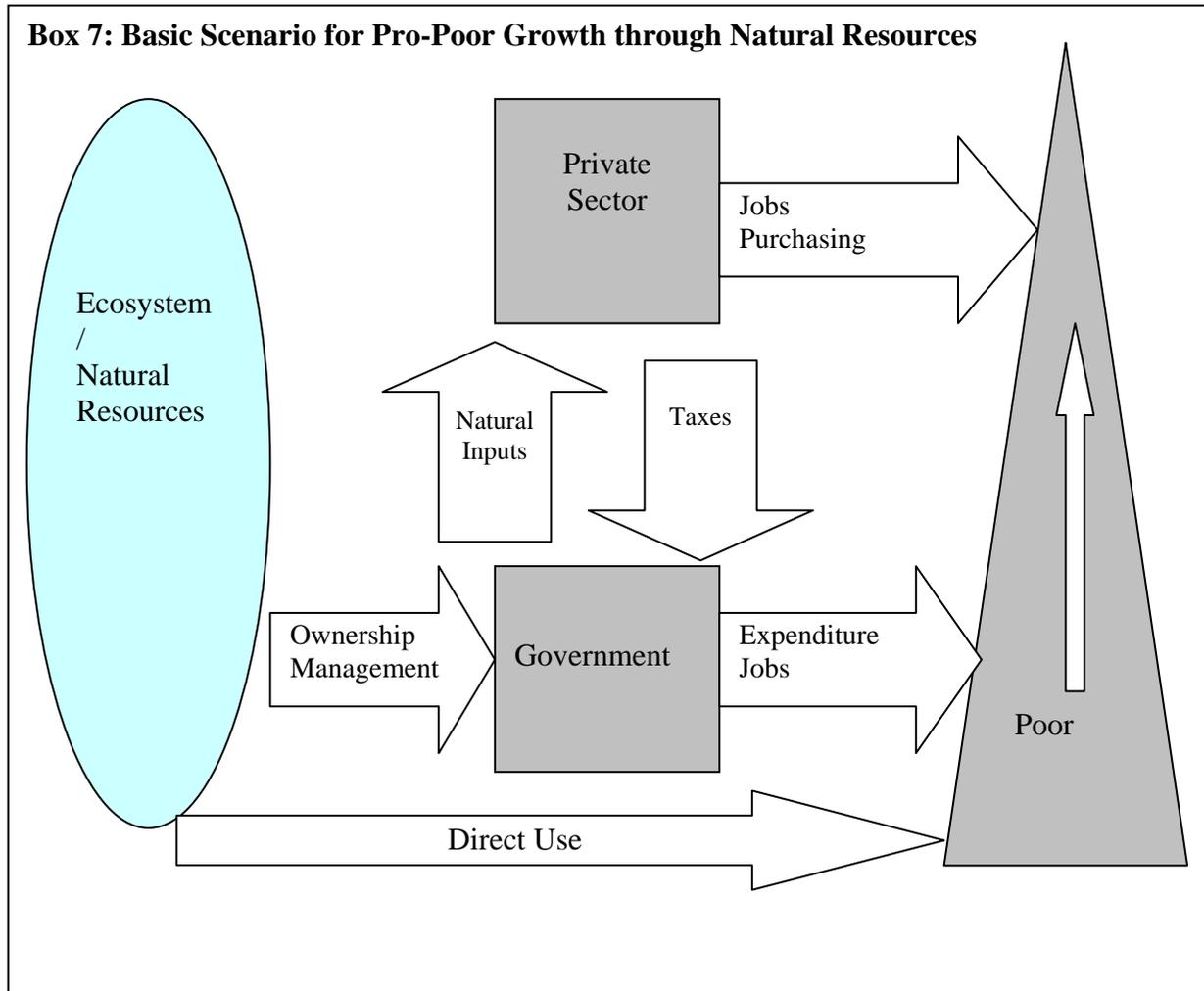
It is interesting to note that this is an ‘income-defined’ measure of poverty status (as opposed to more broadly-based poverty indicators or approaches). The absolute definition of pro-poor growth considers only the incomes of poor people. DFID explains that

‘the ‘pro-poor’ growth banner is useful because it aligns economic growth with changes in the well-being of the poor. This helps to build coalitions between developing-country governments, the private sector and donors. In particular, it makes clear that policy-makers do not have to choose between ‘pro-poor growth’ and pro-poor’ policies. The two outcomes overlap because most policies that increase growth also reduce poverty, and many policies that are effective for reducing poverty also increase growth’ (p.3)

4.4. Framework linking natural resources and pro-poor growth

For many developing countries, with low incomes and high poverty in rural areas, natural resources are often the main wealth available, and contribute to the economic growth and exports of developing countries. In some cases this provides benefits to the poor – but in other cases the politics of natural resource extraction limit pro-poor benefits. In order to

understand the relationship between natural resources (fisheries) and pro-poor growth, it is important to understand the flows of benefits to the poor (routes), the role of government and other actors, and the impact of possible trade-offs between different policy objectives. The framework developed by the OECD DAC ENVIRONET (Steele, 2004) provides a useful starting point, as shown in Box 7 below.



According to Steele (2004), the Basic Scenario of pro-poor growth through natural resources is characterised by the following attributes:

- Natural resources owned and managed (or mismanaged) by government;
- Private sector takes in publicly owned or regulated natural inputs;
- Private sector pays resource taxes to government;
- Private sector provides jobs and purchases (for poor and non-poor);
- Government spends tax revenues on expenditures and provides jobs (to poor and/or non-poor);
- Poor seek to move up to become non-poor;

For African inland fisheries, the natural resources are owned and managed by the national government (*de jure*), the private sector (small to large-scale fishers, processors, traders etc) use these publicly owned resources as inputs to their economic activities, and in turn, should pay resource taxes to the government (although for many African countries the system of tax collection is weak e.g. fiscal systems or export duties), and also provide jobs for others, and purchase services. In turn, the government will use the taxes collected for national expenditures (e.g. infrastructure) and to provide jobs (public sector) for both the poor and non-poor. It is expected that if this system functions effectively the poor will become non-poor.

So the poor can benefit from ecosystems in six main ways (it is interesting to compare these flows with the table of indicative values, above):

- direct use (i.e. harvesting for subsistence use);
- direct use that becomes a route out of poverty (i.e. through moving into small and medium scale natural resource processing);
- government employment;
- government expenditure;
- private sector employment;
- private sector purchasing

For African inland fisheries, the available information indicates that:

- direct use for subsistence is very important (the most important in many countries, especially in the face of weak economic growth and limited alternative employment);
- direct use (and re-investment of capital in other economic activities) is also important, and is vital as means of livelihood diversification to reduce vulnerability to poverty; however, it depends on the context, and certainly will be beneficial in enabling environment (good opportunities, lower economic risks, low political uncertainty);
- government employment is also important in fisheries (although many countries have undergone SAP and reduced the size of the public sector);
- government expenditure in the fisheries sector is often weak and limited (many governments are not effective in collecting and using resource taxes);
- private sector employment in the fisheries sector is important, but there are concerns in many countries about the extent of unfair employment (private sector employers reducing costs by setting low wage rates in labour-surplus economies, and by poor working conditions, especially if the general economic environment is not 'enabling' and prone to risk); under these conditions, the employees remain vulnerable to poverty;
- private sector purchasing is important, but the nature of the relationship can be unfair (at the same time, there is little research in these areas); at the same time, an active private sector can help to generate high levels of secondary employment, even under difficult conditions (see the case of the informal fish trade below).

It is also explained (Steele, 2004) that there may be trade-offs, as follows:

- increasing private sector inputs may undermine direct use options for the poor. For example, exclusive fishing rights may impose costs on poor fishers. Larger firms will

reduce options for small and medium sized natural resource processing to provide a route out of poverty;

- increasing revenue from private sector, will require promotion of larger (often foreign firms) which may have fewer purchases in the local economy and generate less jobs for the poor (tend to more capital intensive and require high skilled jobs);
- government expenditure may be better invested in infrastructure for more competitive, labour intensive industry and for more human capital formation than used to pay for public sector employment expansion;
- **all options rely on a well-managed or regulated natural resource base.** If this is not the case, then all options can lead to declining growth. This is particularly the case for renewable resources where the resource can be extracted at rates to allow regeneration. Typically the resource base will decline faster with private sector expansion. However, this can be mitigated by government diversifying the economy away from natural resources towards labour intensive industries.

There are at least three development scenarios for consideration:

- (1) Top-down scenario: promotion of private sector with high revenues, but undermines direct use and natural resource small and medium processing efforts;
- (2) Bottom up scenario: encouragement of direct use and small and medium natural resource processing, but little revenue or skilled jobs;
- (3) Twin-track strategy – in practice most natural resource rich countries have followed a compromise – with a dualistic sector of large scale private sector and small-scale subsistence poor users. This inevitably leads to conflict.

The empirical (scenario) testing of this framework for natural resources and pro-poor growth has confirmed that natural resources can contribute on a sustainable basis to pro-poor growth, despite policy (political) challenges to progressive reforms. However, this is by no means guaranteed, There are many examples of natural resources generating boom and bust cycles that hit the poor most when economic decline sets in. To change the situation varies by resource and country context. But in general it requires **coalitions for reform** that can articulate and implement a vision of sustainable resource management that benefits the poor.

5. FACTORS AFFECTING INLAND FISHERIES IN AFRICA AND THE PERFORMANCE OF DEVELOPMENT INTERVENTIONS – 5 THEMATIC AREAS

5.1. Introduction

In the following section, a set of factors within five thematic areas which have an important effect on inland fisheries and their contribution to sustainable development will be identified and examined. The factors have emerged from the characterisation of inland fisheries (above), and represent five important areas where expert opinion (as expressed in the international literature) indicates that attention is needed at the moment in order to improve fisheries development performance and reduce poverty. For each of the thematic areas, there are three sub-sections:

- first, an overview and impact assessment is given (what impact has this area had on fisheries development?);
- second, two case-studies of the types of interventions used currently to address these areas and the performance resulting will be provided;
- third, lessons for the future will be derived (if possible?)

5.2. Thematic area 1: Information, analysis and knowledge

5.2.1. Overview and impact assessment

The characterisation of inland fisheries in Africa (the actual exercise) revealed an important set of key findings with regards to the status and impact of information, analysis and knowledge for this sector, as shown in Box 8 below.

In summary, there is a serious lack of information on inland fisheries in Africa, and what information is available is often highly localised and not up to date. The information base also lacks the type of multi-disciplinary and inter-sectoral character needed for effective fisheries policy design and fisheries management. As in many parts of the world, the information base is dominated by environmental and ecological information, and there is a lack of social science information to complement this. The information available is collected and used within analytical frameworks which are biological in nature (e.g. surplus yield models). Other more multi-disciplinary and integrated frameworks (e.g. bio-socio-economic models or the Sustainable Livelihoods Approach) which would be more appropriate for fisheries development planning and policy design are only beginning to be used in certain parts of Africa. In general, there have been many difficulties experienced in attempting to establish workable and cost-effective fisheries information systems in Africa (as in many parts of the world). In addition, there is no guarantee that information generated will improve fisheries policy planning, fisheries management or have an impact on fisheries development outcomes (there are communication gaps between fisheries policy-makers and scientists for example). Overall, then, the policy process and fisheries management for African inland fisheries is not adequately supported by effective information systems, the use and application of relevant multi-

disciplinary analytical frameworks, and in the end the process of knowledge accumulation for fisheries development is constrained.

Box 8: Thematic Area 1: Information, Analysis and Knowledge for Fisheries Development in African Inland Fisheries: Key findings

- Overall, information on inland fisheries is lacking at national and international levels;
- Available information is often highly localised and not up to date;
- Information base is dominated by environmental and natural science information;
- Information base has relatively little information in the social sciences;
- There is a lack of multi-disciplinary information collection and analysis;
- The theoretical and conceptual basis for fisheries management is science-based (biological and technical fisheries approaches);
- There is minimal use of analytical frameworks involving multi-disciplinary, holistic and inter-sectoral approaches (e.g. bio-socio-economic models or the Sustainable Livelihoods Approach) which could guide fisheries development planning;
- Fishery departments in many African countries have unable to collect fisheries statistics on a long-term basis and o provide adequate coverage of key fisheries because of a lack of funding;
- The effective operation of fisheries information systems has proved to be difficult in many countries with a lack of appropriate designs (technical issues), capacity and funding;
- Information which is generated by scientists is not always communicated effectively to decision-makers;
- Local or traditional knowledge used by local actors is not part of the national decision-making process in most countries;
- Policy decision-making at national level and the implementation of fisheries management systems by fisheries department is weakened by a lack of information, appropriate analysis and a low accumulation of relevant knowledge;

5.2.2. Case-studies

The inter-related problems of how to generate information to inform policy decision-makers on fisheries development, and how to ensure that the most appropriate conceptual and analytical frameworks are being used to address the core issues are highlighted in Case-study 1 and Case-study 2 below.

In Case-study 1, a project operated in collaboration between the SFLP and the national fisheries administrations of the five riparian countries of the Lake Chad Basin has developed a workable and cost-effective fisheries information system (FIMS) based on market and trade routes.

In Case-study 2, the work of the SFLP is shown to be underpinned by a new, holistic and multi-disciplinary framework (the Sustainable Fisheries Livelihoods Approach) for identifying and understanding the causes of poverty in fishing communities, and in turn, using new techniques such as ‘Poverty Profiling’ to generate new information in order to help policy-makers plan the most appropriate interventions in the future.

Box 9: Case-study 1: Development of workable and cost-effective information systems – Lake Chad Basin (Neiland, 2005)

The Lake Chad Basin is shared by five riparian countries – Cameroon, Chad, Central Africa Republic, Nigeria and Niger. The artisanal fisheries located on Lake Chad, and Rivers Chari and Logone, supply a trade in smoked/dried fish to markets mainly in southern Nigeria with an annual volume of over 100,000 tonnes (valued at US\$50 million first sale value). The markets and trade routes are well-defined and have used as basis to develop a workable and cost-effective fisheries information monitoring system (FIMS), with the national fisheries administrations cooperating the Sustainable Fisheries Livelihoods Programme (SFLP). The most recent project has demonstrated the possibilities for fisheries monitoring and analysis based on a simple 3-part information system which incorporates trade monitoring, stakeholder analysis and policy analysis. Most importantly, **it has been shown that the information and analysis generated can make an important and timely contribution to the policy process, while requiring relatively low levels of capacity-building and operational funding.** The project highlights that the fisheries policy process in other countries might also benefit from the support of this type of targeted, pragmatic and low-cost information system.

Other references: Halls et al. (2005, in press)

Box 10: Case-study 2: New multi-disciplinary and holistic approaches to fisheries development and poverty reduction: the Sustainable Livelihoods Approach and Poverty Profiles (Horemans, 2004; Pittaluga et al. 2004)

The primary objective of fisheries development is to improve the welfare of fishers and other people, and to reduce poverty. For many years, it was assumed that the best approach was to increase fish catches, and then to manage fish stocks to give a maximum yield. However, experience has shown that larger catches do not necessarily reduce poverty, and management systems are difficult to implement successfully. Alternative conceptualisations and analysis of fisheries development and poverty have shown the importance of adopting a multi-disciplinary and holistic approach. The Sustainable Fisheries Livelihoods Programme (SFLP) in West Africa works to reduce poverty in coastal and inland communities by improving the livelihoods of people dependent totally or partially on fisheries and aquatic resources. It does this primarily through the development of social and human capital in communities, by enhancing the natural assets of those communities, and by supporting the development of the appropriate policy and institutional environments. **A core conceptual framework and methodology used by the SFLP is the SLA. This holistic tool tries to capture and provide a means of understanding of the vital causes and dimensions of poverty.** The SLA is people-centred, responsive and participatory, multi-level, conducted in partnership and dynamic. The SLA helps different actors to understand that fisheries management is a process that does not just impact on, but is influenced by, their livelihoods and livelihood strategies. Using the SLA, a Poverty Profiling technique has been developed and tested to cost-effectively identify who are the poor? And why are they poor? The profiles provide important information for policy-makers to plan appropriate interventions.

Other references: SFLP, 2000; SFLP, 2001.

5.2.3. Lesson for the future

There are three lessons which emerge from the case-studies, with regards to ensuring that African inland fisheries development in Africa is supported by appropriate information, analysis and knowledge:

- (i) it is possible to generate a flow of policy and management information relevant to African inland fisheries using relatively simple and cost-effective and sustainable information systems;
- (ii) information systems must have a clear purpose and function; they must arise and serve the policy and management framework that is in place (policy-makers and fisheries managers are the clients);
- (iii) it is important that fisheries administrations broaden the conceptualisation and analysis of fisheries and fisheries management in order to address poverty and livelihood objectives;

5.3. Thematic Area 2: The Policy Process

5.3.1. Overview and impact assessment

The characterisation of inland fisheries in Africa (above) revealed a set of key findings about the policy process for fisheries development in Africa as shown in Box 11 below.

In general, there is a lack of information on the policy process for inland fisheries in Africa. To be more precise, while it is recognised that the design and implementation of appropriate policy is critical to ensure that the fisheries sector works and contributes to sustainable development, there is also a general perception that the performance of fisheries policy has been weak, with a failure to meet major objectives (e.g. maximum sustainable production, conservation of fish stocks, secure employment etc). The nature of the policy process and the way in which it functions has not been investigated to any significant degree in most countries in Africa, and this limits the opportunities to change or improve policy-making and implementation.

At the same time, while most countries appear to retain a policy framework and process established since Independence, others have modified or even changed radically their fisheries policy during this time (with both positive and negative outcomes for development). Ultimately, the quality of policy-making and implementation is dependent upon institutional capacity and organisational development, and this must be supported politically. A key requirement overall for the policy process is the need for greater participation by actors at all levels of society, and for different constituencies of actors to negotiate and choose between different policy options (this is a characteristic of good governance, and requires serious political development as part of the process of sustainable development (i.e. it is difficult to impose a system of good governance in a situation where it did not previously exist). Another important entry-point for improving the policy process is the need to have the importance (or value) of fisheries and aquatic resources recognised by politicians, and to secure their support for policy change and development relevant to securing and enhancing these important (or valuable) resources.

5.3.2. Case-studies

The two case-studies (Case-study 3 and Case-study 4) in this section demonstrate the types approach which can be used to assess the importance (or value) of inland fisheries,

Box 12: Thematic Area 2: The Policy Process for Fisheries Development in Africa: Key findings

- The design and implementation of appropriate policy by government is critical to ensure that the fisheries sector is harnessed appropriately for national development;
- The policy process for fisheries has not been investigated or analysed in most African countries; there is a tendency to assume that the policy process will work in a 'linear' manner (with government setting goals and then implementing them); there is little work on the non-linear policy process (focusing on the political economy and the governance context);
- The fisheries policy process appears to be quite variable from one country to another in Africa; although there is relatively little information available in the public domain concerning policy performance, the general perception is that fisheries policy performance for African inland fisheries has been weak (with a low achievement of objectives);
- In some countries, fisheries policy has hardly changed in 50 years, with a portfolio of policy objectives which usually include: maximum sustainable production, conservation of fish stocks, supply of fish to national markets, secure employment for communities and the development of export trade;
- In other countries, the fisheries policy process has been more dynamic, and has changed and/or adapted to various forces/conditions (with both positive and negative outcomes for development);
- The quality of policy-making and implementation is dependent on institutional capacity and organisational development (which is in turn a function of political support);
- The need to promote greater participation in the policy process at all levels of society is widely recognised; for different constituencies of actors to propose, advocate and choose between different policy options as part of a system of better governance;
- In many countries, the importance (or value) of fisheries for development (growth, poverty reduction) is not well-recognised, and therefore political support, and institutional and organisational development (with necessary funding) have been minimal;

and then how this type of information can be used to create an enabling policy environment for effective inland fisheries management focusing on poverty reduction.

In Case-study 3, the application of economic valuation techniques in the Barotse Floodplain in Zambia revealed that wetland resources (with fisheries as a major contributor) had a net economic value of over US\$8 million/yr. By comparing different management strategies for these wetlands, it was calculated that the 'wise use' of wetlands option (as opposed to 'do nothing' or 'protected areas and agriculture development option') would give the highest economic return (i.e. greatest contribution to the economy). The study results have been made available to decision-makers in the Zambezi Basin. This type of information has not been used in the planning process previously. The study also indicated that upstream development (e.g. dams and reservoirs) would incur devastating economic losses by changing flows and altering the wetlands.

In Case-study 4, the experience of the ILM project working with the Department of Fisheries Resources (DFR) to create an enabling policy environment in Uganda is highlighted. This collaboration has been successful in ensuring that the contribution of fisheries is recognised in the national framework for poverty reduction, the creation of a new fisheries policy and legislation, the formation of new management institutions and organisations at different levels (local-national), and a set of mechanisms for policy

implementation, including planning and securing necessary funding. The success of this initiative is attributable to careful planning, a receptive political situation and the role of a well-designed project as an agent for change in this policy context.

Box 13: Case-study 3: Building awareness of the importance of African inland fisheries for policy-makers – Valuation of the Barotse Floodplain, Zambia (Turpie et al. 1999)

The Zambezi River Basin system, and especially its wetlands, with important fisheries, have a high economic value, but increasingly degraded through resource over-exploitation, land drainage and encroachment for agriculture, plus hydropower and irrigation schemes. The ecological and economic value of wetlands to rural communities are not fully appreciated in river basin planning, and land/water/fisheries management. The Barotse Floodplain is 550K ha (total Zambezi wetlands is 1.2 million ha); mainly grassland, with 225,000 people (27,500 households). Livelihoods are linked with seasonal flooding; mixed livelihood strategies (farming/fishing), subsistence economy; and 76% poverty. What is the value of local level wetland resource use by wetland communities? Study in two parts: scoping exercise followed by household surveys (quantitative data) and focus groups. Data analysed using a static economic model to determine value of each wetland resource: financial (private net cash income) and economic returns (net value to national income). **Local use of wetland resources has net economic value of US\$8.64 million per year; or net financial rtn of US\$405/hh/yr (83% was subsistence values and home consumption).** Dynamic model used to calculate NPV of wetland resources under different future management scenario (do nothing; wise use; protected areas & agric. Development). Most economically valuable future management option was 'wise use' of wetlands. There are no developments upstream of the Barotse wetlands (although a large no. of hydropower schemes, dams and reservoirs have been identified for possible development along the Zambezi). The current study emphasized that any upstream development, if it influenced downstream river flow and flooding, would be likely to incur devastating economic losses to local communities on the Barotse Wetlands. Local economic values have not been a factor in decision-making in Zambezi Basin, but need to be in future to avoid inappropriate management which jeopardized livelihoods;

Box 14: Case-study 4: Creating an enabling policy environment for poverty focused lake management – the Integrated Lake Management (ILM) Project in Uganda (ILM, 2004)

Capture fisheries on lakes, such as Lake Victoria and Lake Kyoga contribute significantly to the national economy of Uganda through exports, employment and food security. To secure these resources and to ensure that local people benefit from them, the Government of Uganda (GoU) is implementing a new management approach based on : (i) decentralisation of natural resource management functions; (ii) empowering local communities to co-management natural resources; and (iii) improving the livelihoods of the poor. The UK DFID supported the GoU in developing and implementing this new approach through the ILM (1999-2004). The experience of the ILM project provides evidence of the essential role a well-designed project ('an agent for change') can play in the development process where changes in policies, legislation, institutions, attitudes and practices are needed at many levels. **The ILM project (working alongside the Department of Fisheries) has demonstrated that an enabling policy and institutional environment can be achieved**, including: (1) Poverty focus – fisheries are now recognised in the overarching policy framework for development – the Uganda PRSP (or Poverty Eradication Action Plan); (2) National Fisheries Policy – the participatory development of a new policy was essential, especially for developing new institutional arrangements; (3) National Fisheries Legislation – to provide empowerment for community organisations; (4) Fisheries management institutions – new institutions were created at national, lake wide and community levels (with strong inter-linkages); (5) National Fisheries Sector Strategic Plan (FSSP) – the mechanism to implement National Fisheries Policy , and to attract necessary investment and funding from central budget and development partners; (6) Sector Wide Approach (SWAp) – to allow different sectors to work together; (7) Local Government Development Plans – lake management plans and budgets must be integrated into local government planning systems, and be designed to compete for financial resources by demonstrating contributions to poverty reduction, improved livelihoods and economic development. Other references: Pomeroy et al. (2004); RoU (2004);

5.3.3. Lessons for the future

There are at least three lessons which can be taken from these case-studies relating to the policy process for inland fisheries in Africa:

- (i) Policy change and reform for inland fisheries in Africa can be achieved under certain circumstances, and a better understanding of how the policy process functions (or the constraints to its effective operation) in a particular country, is an important starting point for future actions;
- (ii) The role of ‘an agent for change’ (such as an externally-supported project) to catalyst or lobby for policy reform, and to help organise and focus coalitions of key actors in a particular sector or area is one option;
- (iii) The chances of securing political support for policy change in a particular sector can be increased by demonstrating the importance and value of that sector to the country and its population in question.

5.4. Thematic area 3: Fisheries management systems

5.4.1. Overview and impact analysis

The characterisation of inland fisheries in Africa (above) led to a series of key findings on fisheries management as shown in Box 14 below.

In summary, in most African countries State fisheries departments are responsible for the management of inland fisheries. The management systems are usually based on a centralised, hierarchical administration (top-down; command-and control) with the maximisation of fisheries production (with reference to MSY) as the key objective. The management instruments usually include access and effort controls through licensing and gear regulations, which should be enforced by local fisheries officers, who also collect licence fees and apply fines as sanctions. In reality, in most countries, State fisheries departments are severely constrained by a lack of staff, technical expertise and funding. Most inland fisheries (especially where traditional management is not in place) operate under conditions of open-access (i.e. there is no management at all). As a result, many fisheries show signs of increasing pressure on resources, overexploitation, stock decline, falling catches, conflict and poverty. In recent years, alternative approaches to centralised management have been suggested and tried, including community-based and co-management. It has also been proposed that the underpinning policy framework should re-orient towards livelihoods, pro-poor growth and wealth creation. The apparently worsening crisis in fisheries management for inland fisheries is a major challenge at local and national level, but is even more problematic at regional level when fisheries are shared between different countries.

Box 14: Thematic Area 3: Fisheries Management Systems for African Inland Fisheries

- In most African countries, fisheries management policy is implemented through a state fisheries department, with a supporting legal framework and budget allocation
- State fisheries management systems are typically based upon a top-down, hierarchical and centralised administration, with a Director controlling local fisheries officers;
- The management objective is usually the maximisation of fisheries production (with ref to MSY and other science-based targets), and management instruments include effort control through licensing plus gear restrictions;
- Local fisheries officers attempt to collect licence fees, and enforce regulations (e.g. using fines);
- In general, this type of system has not performed well – many fisheries show signs of overexploitation, fishing pressure is increasing, gear restrictions are ignored, conflict is increasing; and many fisheries operate under conditions of open-access (de facto);
- State fisheries departments often lack staff and technical capacity, and have limited funding; the ability to operate is seriously constrained;
- In many countries, community-based or co-management has been advocated as a viable alternative to centralised fisheries management;
- It has also been suggested that fisheries policy and fisheries management should be re-oriented towards livelihood support, pro-poor growth and a wealth-based approach (i.e. not to do the same things better, but differently);
- For African inland fisheries, national and local level management represent major challenges in most countries; the situation becomes even more complex and difficult in attempting to undertake fisheries management at a regional level (since many inland fisheries are shared with hydrological basins);

5.4.2. Case-studies

The challenges of attempting to effectively manage inland fisheries in Africa at local, national and regional levels are illustrated in the two case-studies in this section (below).

Case-study 5 relates the experiences of co-management initiatives in Malawi, as an alternative to centralised State management systems – in this case contrasting both successful and unsuccessful schemes. The case-study highlights the factors which can affect the performance of co-management arrangements including the role of government in the partnership, the role of existing vested interests and the negative impact of short-term donors funding. It is concluded that co-management requires careful planning, consensus between actors, significant human and financial support, and certainly plenty of time and an enabling environment. It is not a ‘quick fix’ solution to the current fisheries management crisis, and must also be seen as one component of a broader development approach which generates opportunities and increased welfare for rural people.

Case-study 6 highlights the urgent need for improved fisheries management in Lake Tanganyika – Africa’s second largest lake contains major fisheries which underpin the livelihoods of over 1 million people – but which increasing population pressure and the high demand for livelihood opportunities, the resource base and the existing flow of benefits are under severe threat. The lake is shared by four countries, and although their stated policies emphasis social welfare objectives, they lack the institutional and financial means to implement them. The fisheries operate under conditions of free and open-access. A recent collaborative project between the FAO/Dannida, local fisheries

communities and fisheries authorities has proposed a management plan for the lake. However, the planning and implementation process involved in securing agreement between all the parties involved at all levels is complex and slow. The key question is whether the proposed solution will be implemented in time to prevent the collapse of the fisheries and the social and economic disruption which will inevitably follow.

5.4.3. Lessons for the future

There are three lessons (at least) which have emerged from the case-studies and the characterisation exercise, as follows:

- (i) There are workable alternatives to centralised State fisheries management systems, and in particular, co-management can be effective if the design and implementation is careful and appropriate to local conditions;
- (ii) Fisheries management at a regional level is a major challenge, and is complicated by the need to secure the agreement of riparian partner countries with a hydrological basis; it is difficult to find examples of successful regional inland fisheries management, and initiatives at this level will require major support and attention in the future given the urgency of the problems involved, and the large numbers of people affected;
- (iii) 'Time' is a crucial factor for fisheries management – on the one hand, time is needed to plan and implement, learn and adapt successful systems; on the other hand, some fisheries need action to be taken immediately to offset major problems (they are running out of time). It appears that different policy, planning and implementation responses will be needed to address different situations and needs, and institutions and organisations must be designed with this in mind.

Box 15. Case-study 5: Alternative approaches to State Fisheries Management – Lessons from Malawi’s Experience with Co-Management Initiatives (Hara et al. 2002)

Co-management arrangements were introduced in Malawi on Lakes Malombe and Chiuta in 1993 and 1995 respectively in response to a decline in catches and a search for an alternative fisheries management system (to replace state management). The government motivated and facilitated the partnership in the former, while the fishers initiated it in the latter. In general, co-management advocates a shift away from autocratic and paternalistic modes of management to ones that rely on the joint efforts of government agencies and users. However, while this paradigm shift has been extensively advocated by development experts, it is also accepted that it remains a challenge to demonstrate what kind of co-management has been successful and under what conditions. In Malawi, co-management seems to have had a positive effect on the fishery of Lake Chiuta, but not for Lake Malombe (measured in terms of catch stabilisation and adherence to new rules). The reasons for this outcome include: (i) the role of government in the partnership and the organisational set-up; (ii) power and authority struggles between the new management groups, (iii) the Beach Village Committees (BVCs) and the existing traditional authorities (village headmen); (iv) the extent to which vested interests in the fishery participate in the management regime; (v) issues of legitimacy and incentives for participation; (vi) the effects of limited short-term external (donor) funding to the programme; (vii) ineffective and ambiguous enabling fisheries legislation; (viii) the effects of prevailing socio-economic conditions on operational decisions and resulting dilemma around the implementation of limited access. Overall, then, co-management requires careful planning and assessment, it requires early participation and consensus between the actors involved, it requires significant human and financial commitment, and it needs time to develop and establish within an enabling environment. **In some situations, co-management might be one positive reform, but it will not be sufficient on its own to solve the increasing crisis in fisheries management** – this requires economic growth, to provide new opportunities for rural people outside the fisheries sector.

Other references: Jul-Larsen (2003)

Box 16: Case-study 6: Regional and basin-wide international fisheries management – the fisheries of Lake Tanganyika (Reynolds et al. 2002)

Lake Tanganyika is shared by four littoral states – Burundi, the Democratic Republic of Congo (DRC), Tanzania and Zambia. The lake is the second largest in Africa, supports some 45,000 fishers (mainly artisanal) and annual fish landings are 165-200,000t/yr. The fisheries and related fish trade are a major source of livelihoods for over 1 million people, in a region with high poverty. While fishing remains an attractive source of employment and livelihood, it has been concluded that increasing population loads are having extremely serious consequences – unsustainable exploitation of fisheries and other natural resources and declining human welfare conditions. Although the littoral countries share a state policy orientation towards social welfare objectives, they lack the institutional and financial means to implement policy. There is a lack of regional harmonisation of fisheries management regulations and institutions, and severe conflict in DRC and other countries has hindered legal-institutional development. Recent collaboration between the FAO/Finnida Lake Tanganyika Research Project, local fishing communities and fisheries authorities has produced The Framework Fisheries Management Plan (FFMP) for Lake Tanganyika based on the CCRF. This was developed as a basic set of recommended policy initiatives and practical actions to: (i) help set the overall regional fisheries management stage; and (ii) address problems demanding immediate attention because of potentially serious sustainability impacts. FFMP implementation is to take place through the 5-year Tanganyika Regional Fisheries Programme (TREFIP), through a set of four national project components coordinated by a Regional Programme Implementation Unit. **The actual implementation of this initiative will require – mobilisation of resources (finance/political), close collaboration between different agencies and an enabling environment. The question is whether these requirements will remain insurmountable constraints into the future.** The alternative is to rely upon the cooperation of the four countries through the FAO-facilitated Lake Tanganyika CIFA Sub-Committee; and latterly to facilitate the creation of a permanent regional fisheries management body. A GEF Strategic Action Programme (SAP), a Lake Tanganyika Convention and a Lake Tanganyika Authority are also being planned. But is there time for the fisheries and the people involved, given the current trend of decline?

5.5. Thematic Area 5: Fiscal frameworks and investment strategies for fisheries development

5.5.1. Overview and impact assessment

The characterisation of inland fisheries in Africa (above), when considered within the context provided by the theoretical perspectives (Box 4 and Section 4 above) led to a series of key findings on the nature of fiscal frameworks and investment strategies, as part of fisheries development policy in general (Box 17 below).

In summary, theory on economic development recognises the important relationship between public and private investment. Public (government) investment must be directed (amongst other areas) to the provision of infra-structure (education, health, communication systems) and also create an enabling environment and incentives for private investment through economic stability and political security. Private investment is essential for growth (and pro-poor growth in particular) since it creates jobs, increases capacity and raises economic productivity. A primary source of government revenue (other than loans/grants/aid and other forms of income generation) for public investment is taxation of private (domestic) producers and consumers. Thus, for example, government fiscal arrangements will manage the volume of spending by consumers, and instead the resources can be used to build up capital assets. It is evident from experience that development interventions must be supported by appropriate investment strategies, and investment planning must consider the form, the amount, timing, delivery mechanisms, risks and uncertainties, and the overall management of investment funds.

In Africa, investment in fisheries has come from a variety of sources (e.g. international/national; public/private) and in many forms (e.g. large/small; venture capital/grants/loans/credit). However, despite a large investment in fisheries from public sources (international/national), there is a perception (precise and comprehensive information is lacking) that the performance fisheries development projects in general in Africa has been weak. One of the reasons appears to be a lack of appropriate investment planning and management (including disbursement and accountability). For many countries in Africa, there is a severe competition for investment amongst different sectors and the fisheries sector is often lacking the necessary political support. The situation is obviously even more serious when the economy is weak, and hampered by debt and weak policy and institutional capacity. The role of international aid under such conditions is critical, and the management of grants/loans from bi-lateral and multi-lateral aid is increasing coming under the umbrella framework provides the national Poverty Reduction Strategy Papers (PRSPs).

The relationship between public and private investments in the fisheries sector appears to vary greatly between countries (although it is difficult to find a comprehensive review). In some countries, the creation of enabling environment and effective public investment has in general encouraged private investment from both domestic and external sources (some countries activity encourage direct foreign investment, some require local partnerships). In other countries, both the lack of an enabling environment and a low

Box 17: Thematic Area 4: Fiscal frameworks and investment strategies for fisheries development

- Economic development requires both public and private investment; public (government) investment must ensure adequate investment in infrastructure (education, health, communication systems) and also create strong incentives for private investment (stability and security, economic and political); private investment is essential for growth (it creates jobs, increases capacity, raises productivity);
- Government revenue for investment must be secured from taxation of domestic producers (taxation reduces the volume of spending by consumers, and the resources of a country can be used to build up capital assets);
- Development interventions must be supported by appropriate investment strategies; investment planning must consider the form, amount, timing, delivery mechanism and management of investment funds;
- Investment in fisheries has come from many sources (international/national; public/private), and in many forms (large/small amounts; grants/loans/credit);
- Despite large investment in fisheries, the general performance of public-funded fisheries development projects has been weak; there is a need for better investment planning in fisheries, backed up by political commitment, to deliver the most appropriate funding arrangements for new projects; but this is often difficult in many African countries which are characterised by a weak economy, severe debt and limited administrative capacity;
- The relationship between public and private investments in fisheries varies greatly; in some countries, effective public investment in general has encouraged formal private investment; in other situations, public investment in general is limited, and private investors operate as part of the informal economy (e.g. the inland fish trade is active and informal in many of parts of Africa);
- Experience shows that without the establishment of a formal relationship between public-private sectors, the economy is unlikely to grow and provide an effective basis for sustainable development;

of successful public investment have discouraged private investment. Under such conditions, private investment is often made and works effectively in the unofficial or informal economy, and private entrepreneurs quickly respond to market opportunities. However, in the long-run, the development record shows that it is important to establish an effective relationship between the public and private sectors. With this, it is unlikely that pro-economy growth will be achieved. For the natural resources sectors in particular it is vital that the activities of the private sector are controlled within a national policy and management framework established and enforced by government for the benefit of society as a whole.

5.5.2. Case-studies

The importance for fisheries development interventions of appropriate fiscal and investment strategies is illustrated by the two case-studies in this section.

Case-study 7 focuses on the experience of public investment in inland fisheries in Nigeria and Malawi. In Nigeria, the weak performance of successive phases of fisheries development from 1962 to the present day has been linked to a gradual erosion of real funding (not just allocations) from government which has constrained effective policy implementation. In Malawi, where the fisheries sector receives international aid support,

Box 18. Case-study 7: Appropriate investment to support fisheries development: Experiences from Nigeria (Ladu and Neiland, 1997) and Malawi (Alison *et al.* 2002)

Nigeria has the largest population in Africa (120 million people) and there is an equally large demand for fish and other food products. Current fish landings are about 350,000 tonnes, with about 50% of the total from inland fisheries including the River Niger, Kainji Lake and Lake Chad. Since Independence in 1960, fisheries policy has gone through a number of phases of development, culminating in the Agriculture Development Policy (Fisheries sub-component, 1988) and the Inland Fisheries Decree No.108 (1992). Fisheries policy has focused on increasing domestic fish production (with other secondary objectives including earning foreign exchange through fish exports, developing fishery-based industries, rational management and conservation). Overall, fisheries policy performance has been weak at both national and local levels. There are a number of reasons for this outcome including a lack of real public investment. **In fact, the available information indicates that investment has declined significantly since 1960.** The capital allocations for fisheries in the first four development plans and % actual expenditure were: 1962-68: N4.8 million (65%); 1970-75: N17.4 million (31%); 1975-80: N156.8 million (4.6%). The public investment shortfall is thought to continue at present.

Malawi's most important fisheries are on Lake Malawi – Africa's third largest lake – with annual catches of between 20-40,000 t/yr coming mainly from the artisanal sector. The Lake is also a biodiversity hotspot, with a global significance. Lake Malawi provides an interesting case-study of contested policy agendas. **Many of the major donors and international agencies have been involved in the fisheries sector in Malawi since independence, bring a variety of agendas and policies to bear.** These development policies are transmitted into management action by a variety of processes that are mediated by institutional and political context. Today fisheries management in Malawi is moving towards finding new solutions. However, policy-makers remain dependent on donor assistance. There is a need for a sector-wide investment plan to ensure donor funds are used efficiently, and to prevent donors from driving, or undermining, government policy.

Box 19: Case-study 8: Public-private and formal-informal investment in fisheries – the fish trade in Southern/Eastern Africa (Macamo, 1999) and Chad Basin (Ladu *et al.* 2004);

S/E Africa: There is general perception that a large trade in inland fish (usually smoked/dried) within and between countries of South and East Africa, however, it is difficult to find statistics/information on this. One of the reasons is that the trade is largely informal or unofficial (not recorded in official statistics and there is no associated tax revenue to government). For Mozambique, with serious economic, social and food security problems, the informal cross-border trade (ICBT) with its neighbours (Swaziland, South Africa, Zimbabwe, Malawi, Zambia and Tanzania) is worth about US\$77 million/yr for agricultural products (or 60% total trade, ICBT+Official Trade). This includes over US\$15 million in fish, mainly marine prawns but also inland fish products also. The trade is undertaken by both large and small-scale investors, who indicated they need help with: greater availability of foreign exchange and better infrastructure (roads). **Positive effects of ICBT are:** increased food security, employment generation (incomes+poverty alleviation) and complements existing commercial networks (opening up new markets). **Negative effects:** Customs and tax evasion (US\$25 million/yr), lack of transparency in trade and exploitation of intermediaries, and violation of health, sanitary and environmental requirements. Repression of ICBT by government would be counter-productive overall. It might be possible to gradually formalise the trade and provide more enabling conditions.

West Africa: The trade in inland fish from the Chad Basin to south Nigeria urban markets is 20-40,000t/yr valued at US\$20-30 million/yr, and has a significant ICBT component with Chad, Cameroon and Niger. The trade is organised mainly by a few large-scale fish merchants (who provide the investment and take the profits), but at the same time, **the trade provides a livelihood for thousands of people involved including fishers, processors, packers, input suppliers, transporters and fish sellers.** There are also important positive impacts for food security in both urban and rural areas. The trade was enabled by public investment in road infrastructure, capitalising on a strong market demand. Participants in the fish trade are calling for further public investment (credit, market facilities).

mechanisms are gradually being put in place to manage the different sources of funding more effectively, and to enhance national policy development.

Case-study 8 examines the relationship between public and private investment in fisheries, and also formal and informal investment, with regards to the fish trade in South/EastAfrica and also in West Africa. Recent research has shown that there is a dynamic and extensive Informal Cross-Border Trade in agricultural commodities including fish. In the case of Mozambique this represents about US\$77 million worth of trade (60% total trade). This informal trade, financed by private investment, has both positive and negative dimensions. For example, it contributes positively to food security, but there are risks of serious environmental degradation, without government involvement, and a loss of tax revenue for the national exchequer. In Nigeria, the large urban markets of the south (Lagos, Onitsha, Enugu) are important markets for inland fish products from the Lake Chad Basin. The trade is largely informal and financed by private investors. The trade has been greatly facilitated by road construction in Nigeria, and there are thousands of people dependent upon it for a source of livelihoods and food supply.

5.5.3. Lessons for the future

There are three lessons which have emerged from the case-studies and the characterisation exercise, as follows:

- (i) The success of fisheries development is in part related to the nature of the relationship between public and private investment; both the government and private sectors have important roles, by creating an enabling environment and infrastructure and by contributing to economic growth respectively;
- (ii) The performance of fisheries development interventions funded by government has been related weak for inland fisheries in Africa, and this can be linked to inadequate or inappropriate management of investment strategies;
- (iii) Private investment in African inland fisheries is both formal and informal (official and unofficial); in the case of the regional fish trade, the informal nature of this activity has emerged in response to the weakness of the State and the constraints imposed by this; the informal fish trade has both positive and negative aspects, contributing to food security and livelihoods, but resulting in losses to the national exchequer (through tax/customs evasion) and there are also risks of environmental damage (e.g. overexploitation of fisheries). Careful policy development is needed to integrate the informal trade into the national economy.

5.6. Thematic area 5: Networks, partnerships and coalitions for fisheries sustainability and coping with future changes

5.6.1. Overview and impact analysis

The characterisation of inland fisheries in Africa (above) helped to identify a set of key issues relating to the future of this important sector, and in particular to consider the

approach and mechanisms which would be needed to ensure an effective contribution to sustainable development while coping with, what appears to be, an increasingly rapid rate of change within fisheries, and within the wider national and international context, as shown in Box 20 below.

In summary, the importance of inland fisheries in Africa is clearly recognised by a wide variety of different actors, including those directly involved in the sector, and some outside the sector also. However, the degree and nature of this recognition varies from country to country, and the perspective of specific actors also relates to their own particular agendas and relationships to particular development interventions. In some situations, there is little or no interaction between different actors, and/or a lack of cooperation, often leading to conflict. It is also evident that inland fisheries in Africa are impacted by increasing change which threatens the very integrity of the fishery systems. The most serious change at the moment appears to be the escalating of fishing effort, and in the future, the threat of future water management schemes (especially dams) will become more serious. Clearly, appropriate fisheries management systems and appropriate integrated river basin (water) management systems are needed to protect inland fisheries, but also to capitalise on the opportunities which they present for contributing directly to sustainable development. Fisheries in general have the potential to generate sustainable wealth to underpin pro-poor growth. The key question is how to establish the management systems, institutions and organisations required? By considering the recent experience of co-management

Box 20: Thematic Area 5: Partnerships for sustainability and coping with future changes

- The importance of African fisheries is recognised by a large variety of actors: fishers, local community, collective action organisations, local level fishery administrators, local level politicians, national level fisheries administrators, national level politicians, donor agencies;
- Each actor sees the importance of fisheries in a different way, has a particular agenda which influences interventions, and interacts/co-operates with other actors to varying degrees, within a dynamic economic, social and political environment (or there is no interaction or cooperation in some situations, leading to conflict);
- Inland fisheries in Africa are subject to increasing change, much of this change threatens the integrity of fisheries, because current management systems are largely ineffective, and the possibility for this sector to make an effective contribution to sustainable development in the future;
- There is a need to create effective management institutions and organisations to protect and capitalise upon the opportunities presented by inland fisheries to contribute to sustainable development;
- The management of inland fisheries can be seen as process (not as a static, technical fix); underlying this process is communication between actors, collaborative problem-solving and consensus-building on solutions within an integrated system ;
- An important starting point for this process is the building of effective actor networks, partnerships and coalitions, focusing on opportunities and threats in the fisheries sector, and effective mechanisms to address urgent needs, with definite objectives and indicators of success.

initiatives, in particular, the management of fisheries can be seen as a dynamic process (and not a technical fix). Some of the fundamental elements underlying this are: communication between actors, collaborative problem-solving and reaching a consensus on how to achieve solutions. The fisheries management process must be seen as an integrative system which can change, evolve and adapt over time in response to needs

and opportunities. An important starting point for this process has to be the building of effective actor networks, partnerships and coalitions, with a clear focus on the opportunities and threats faced by the fisheries sector, the identification of mechanisms to address urgent needs, and the setting of objectives and indicators of success.

5.6.2. Case-studies

Two case-studies are provided in this section which highlight the experiences of building partnerships, coalitions and networks at two different levels – at the local level in Nigeria, and at the Regional Level in Southern and East Africa.

In Case-study 9, the Kainji Lake Fisheries Promotion Project, implemented by GTZ and the National Institute for Freshwater Fisheries Research in Nigeria, established a varied and multi-level collaborative initiative to promote sustainable fisheries management, with an emphasis on improving the standard of living of fisher people. The experience of the project shows how important a long-term commitment is to creating the necessary momentum for effective action and to build confidence amongst and between different actors. The project also demonstrated how a variety of communication techniques can be used to operate and sustain the networks established.

In Case-study 10, the importance of working at a regional level is highlighted, in the case of the SADC countries, given the inter-linkages between the countries involved – shared fisheries resources, shared water resources, trading partners – and the opportunities for collective regional action – sharing of information, sharing of expertise, enhancing trade opportunities, promoting regional fisheries management. The case-study indicates some of the steps which have already been taken to address regional fisheries issues, and the plans for future initiatives and actions, which emphasise cross-cutting topics and possible mechanisms to address constraints in areas like regional trade.

Box 21: Case-study 9: Communication for Development in Research and Extension: The approaches of the Nigerian-German (GTZ) Kainji Lake Fisheries Promotion Project, Nigeria (Ladu *et al.* 2004)

This project operated from 1993-2002 with the aim of sustainable fisheries management to improve the standard of living of fishing communities. Components included a community-based fisheries management plan, information system, extension system and environmental management (hyacinth control). **Early actions included extension communication activities, workshops and village meetings with fishers and their leaders – to promote understanding, generate awareness and promote co-operation between actors.** Establishment of a regular radio broadcast (3 times/week) prepared in cooperation with fishers. Support from other local leaders also. Demonstration and extension of fish processing technologies and alternative activities (fruit, soya beans). Variety of media: newsletters, posters, drama group. There are good indications that the ideas and approaches presented have been adopted at community level and by other actors, and that fisheries management will improve into the future

Box 22: Case-study 10: Regional and international level – the case of SADC fishery initiatives (SADC, 2001)

SADC (Southern African Development Community) was created in 1990, and includes Angola, Botswana, Lesotho, Malawi, Mozambique, Swaziland, Tanzania, Zambia, Zimbabwe and Namibia as members. **In 2001, a Fisheries Protocol was agreed** to promote responsible and sustainable use of the living aquatic resources and aquatic ecosystems of interest to State Parties (but the required number of member states have not ratified it). Cooperation will cover: Management of shared resources; harmonisation of legislation; Access Agreements; Small-scale fisheries; Protection of the aquatic environment; trade and investment; science and technology. A Regional Indicative Strategic Plan (RISDP) has also been developed to pursue a range of strategic goals, with reference to sustainable use of fisheries, food security and human health. Areas for priority intervention, approaches and targets for also been identified. In 2004, a draft action plan for Improved Production, Processing and Trade of Fish from Inland Fisheries and Aquaculture in the SADC Region was produced, on the basis of a meeting sponsored by the WorldFish Center. Specific actions for the period 2005-2010 have been outlined, to be carried out individually and collectively by SADC Ministries, RECs, NGOs, IGOs, collaborating partners, research institutions, private sector and local communities.

5.6.3. Lessons for the future

There are three lessons which have emerged in this section, as follows:

- (i) Inland fisheries in Africa are increasingly impacted by change, and factors such as increasing fishing effort and water basin management for agriculture and hydropower threaten the very integrity and sustainability of this important sector, given the current weaknesses of fisheries management and basin-wide management systems; management needs to be viewed as a process which will be dependent on the integration of different actors, and collaboration in problem-solving and solutions; an important starting point is the creation of networks, coalitions and partnerships;
- (ii) At a local level, the process of fisheries management, involving the collaboration of actors at all levels takes time, and the underpinning relationships can be greatly facilitated by appropriate and sustained communication and media - to inform, educate and change perspectives in favour of collective action;
- (iii) At a regional level, cooperation and collaboration between States within organisations such as SADC will also take time, high levels of collaboration, commitment and appropriate investment to support the required networks, coalitions and partnerships – it is critical to find the right mechanisms to enable this process, and to yield timely solutions to the challenges and threats faced by regional fisheries.

6. FUTURE INVESTMENTS FOR INLAND FISHERIES IN AFRICA

6.1. Introduction

In this final section, a list of suggestions for future investments for inland fisheries in Africa will be made based on the findings of the characterisation exercise and the examination of issues and key lessons within the five thematic areas (above). The focus of these investments will be to enable inland fisheries to make an effective contribution to sustainable development in African countries.

6.2. Thematic Area 1: Information, Analysis and Knowledge

- Identification and prioritisation of research to generate new knowledge relevant to the future management of inland fisheries in Africa, and the design and implementation of national and regional research programmes; to include new perspectives and multi-disciplinary approaches; to include consideration of research capacity needs; and new mechanisms for increasing the utility of research for fisheries policy-makers and managers;
Output: A series of new national and regional research programmes lead to new information and increased knowledge (with high utility value for decision-makers);
- Research and development of cost-effective and pragmatic information systems to support fisheries decision-making at all levels; to include support for the subsequent implementation of the information systems through appropriate capacity-building and organisational change and re-structuring;
Output: Information systems operate on all major inland fisheries in Africa and support decision-making;
- Capacity-building in fisheries systems analysis in order to capitalise on new perspectives for fisheries management by using a combination of natural- and social-science approaches and methods within a multi-disciplinary framework; to include the application of valuation methodology;
Output: Fisheries administrators and managers use a broad range of concepts and approaches to inform their decision-making and planning;

6.3. Thematic Area 2: The Policy Process;

- Support for the investigation and analysis of national and regional policy frameworks and processes relevant to fisheries management (including policy performance evaluation and assessment), and planning exercise to establish a policy advisory unit in each country or region;
Output: Strategic assessment of national and regional policy available for each country and by region (river basins and economic organisations, as appropriate), plus a plan for the establishment of a policy unit (to operate a policy advisory programme);

- Establishment of a policy advisory programme and unit in each country or by region, to identify and facilitate opportunities for policy development and policy management into the future; support required to build appropriate capacity in policy analysis and policy design, and institutional/organisational development within relevant government ministries or departments; new information bases established to monitor policy performance, and provide a basis for lesson-learning and best-practice;
Output: Policy advisory unit for fisheries established in each country or region; a fisheries policy with a clear focus on the contribution to sustainable development is established in each country and by region; the work and action of this programme and unit in each country will lead to improve and new policy for inland fisheries;

6.4. Thematic Area 3: Fisheries Management Systems

- Strategic analysis of the status of inland fisheries management in each country and by region (basin) including the identification, evaluation and assessment of the performance of fisheries management, and the identification of future options and alternatives for fisheries management;
Output: Strategic overview report on fisheries management options by country and region;
- Development of a series of management plans for inland fisheries, including the identification of management units, the identification and involvement of key actors, definition of objectives and targets, methods of regulation, and key inputs required in terms of finance and capacity; a process of fisheries management will be identified for each country and region (identifying pathways for achievement of management goals);
Output: Fisheries management plans for all major and priority fisheries are established;
- A set of Fisheries Management projects are designed and implemented on all major inland fisheries in Africa to implement the proposed fisheries management plans;
Output: Fisheries management systems are established on all major national and regional inland fisheries in Africa with a focus on ensuring that inland fisheries contribute effectively to sustainable development; the exact nature and operation of the management systems will be location specific and will emerge as a result of a process of problem-solving, negotiation and consensus-building between the key actors involved;

6.5. Fiscal frameworks and investment strategies

- Research into appropriate fiscal frameworks for inland fisheries in Africa, and the design and implementation of appropriate fiscal reforms in each country and region; supported by relevant capacity-building and institutional reform;
Output: Fiscal reform is undertaken in each country and region, and is linked with fisheries policy and fisheries management; the wealth generated by well-managed fisheries is used effectively by government to contribute to sustainable development,

through economic growth, supported by suitable investments in infrastructure, institutional reform and legal reforms;

- Creation of an enabling environment and incentives for private investment (both national and international) through policy reform, institutional reform and legal reform. Support will be required to build the necessary capacity in government to develop and implement this approach in the fisheries sector, in cooperation with other sectors.

Output: Private investment in fisheries increases and contributes to pro-poor economic growth; private investor in non-fishery sectors is also enabled and provides alternative employment opportunities for fishers and rural people;

- Increase access to assets and markets for actors in the fisheries sector through investments in infrastructure (broad-based), access to credit and policy/legal reform (reduction of custom duties and clear definition and enforcement of rights). Support need to define the needs (assets and markets), and design and implement a range of appropriate public programmes (in parallel with private sector initiatives above);

Output: Actors in the fisheries sector, especially the poor, have greater access to assets and markets, and can participate in wider economy, which grows and diversifies, leading to an increase in livelihood options and livelihoods benefits (both inside and outside the fisheries sector);

6.6. Networks, partnerships and coalitions

- Strengthen the capacity for national and regional fisheries organisations to facilitate the creation of a network of actors which allows exchange of information on a regular basis, and the opportunity to meet in order to identify and discuss key issues (research, policy, management, investment etc), and to identify and agree the choice of appropriate development pathways and solutions;

Output: 'Fisheries Fora' are established at nation and regional levels to facilitate information exchange and meetings between actors; to allow identification of problems and negotiate and agree solutions;

- Provide the opportunity for national and regional development initiatives to be undertaken (designed and implemented) through appropriate partnerships of actors; create the right incentive structure and institutional framework to facilitate this form of engagement and process, which may lead to the formation of independent fisheries coalitions and constituencies where needed; investment required in institutional development and capacity;

Output: A series of 'Partnership Programmes' in fisheries are established, facilitating the engagement of different actors in addressing key and common problems;

- Encourage networking, partnership and coalition formation between national and regional organisations in Africa with international development agencies and other international organisations; in order to address national and regional development agenda; and to ensure that the development agencies understand the role and

importance of fisheries, and the opportunities for development investment and assistance; appropriate investment required in institutional development and capacity-building;

Output: National and regional fisheries organisations in Africa engage effectively with international development organisations and other international organisations; fisheries agenda, and investment opportunities in Africa are understood and promoted;

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APPENDIX 1:

Table 1: A Summary of Key Concepts and Theoretical Frameworks in Fisheries

| | |
|---|--|
| <p>(i) Fisheries development and poverty reduction;</p> <p>References: CEC, 2000; Neiland & Béné, 2004; Payne, 2000; Platteau, 1989;</p> | <ul style="list-style-type: none"> • Concepts and associated development approaches have evolved over the past 50 years; Early approaches focused on increased fisheries production through technology inputs and modernisation (it was assumed that this would lead to welfare gains and poverty reduction for fishers); • Weak performance of early approach and persistence of poverty has resulted in the emergence of new perspectives and approaches including a more broad-based livelihoods approach to poverty reduction; • The role of fisheries in pro-poor growth and economic development in general is also under review (fisheries as a source of wealth for development); |
| <p>(ii) Policy process</p> <p>References: Sutton, 1999; Keeley (2001);</p> | <ul style="list-style-type: none"> • Concept of the policy process (including policy-making and policy implementation) has evolved recently; • Early version (linear or rational model): seen as a problem-solving process which is rational, balanced, objective and analytical; • Later version (non-linear model): policy process is described as non-linear, consisting of inter-related decisions which evolve over time during implementation, and is inherently a political process; |
| <p>(iii) Policy context</p> <p>References: Barenstein, 1994; Meier, 1995;</p> | <ul style="list-style-type: none"> • Policy context varies between countries; In some situations, there is a high understanding of the policy process and policy changes tend to be small and incremental (chosen politics, low politics, society-centred); • In other situations, there is a low understanding of the policy process and policy changes (to be effective) need to be large and innovative (pressing problems, high politics, state-centred); • Many African countries are found in the latter category; |
| <p>(iv) Governance</p> <p>References: Kooiman, 2001; World Bank, 1997;</p> | <ul style="list-style-type: none"> • Concept has re-emerged in the past 20 years; Early version: governance is what governments do (...the manner in which power is exercised in the management of a country's economic and social resources); • Later definitions have emphasised that governance is the totality of interactive activities and institutional arrangements in which all stakeholders participate to address society's goals and needs; |
| <p>(v) Fisheries governance</p> <p>References: Béné & Neiland, 2005; McGlade, 2001; Nauen, 1995;</p> | <ul style="list-style-type: none"> • Concept has evolved over the past 10 years; early version equated purely to government action in a fishery (principally centralised & top-down, technocratic, science-based fisheries management); • Later approaches have been much more broad-based including the roles of government and other stakeholders, and the emergence of co-management arrangements in fisheries; |
| <p>(vi) Fisheries management systems</p> <p>References: Charles, 1988; Catanzano & Mesnil, 1995;</p> | <ul style="list-style-type: none"> • Three broad concepts: the fisheries science paradigm; the human sciences approach; and the fisheries systems approach; • Early fisheries management policy was based on a narrowly-focus approach (biological principles, stock size and fishing effort control, productionist objectives), which failed to recognise multiple or conflicting policy objectives; • Newer approaches recognise need for multi-disciplinary information, and possibility of multiple objectives or trade-offs (e.g. economic rent generation or stock conservation or social objectives); |
| <p>(vii) Fisheries valuation</p> <p>References: Barbier (1993); Pearce et al. (1989)</p> | <ul style="list-style-type: none"> • The value of fisheries is usually expressed as the market value of production; however, this frequently underestimates the true value since market prices tend to be imperfect, and not all production is marketed anyway; • Fisheries valuation is increasingly using concepts/techniques from economic (environmental) valuation, and also from livelihoods analysis to determine real contribution of fisheries to development, livelihoods and poverty reduction; |

APPENDIX 2: An assessment of fisheries policy and development interventions

Taken from “Fisheries development, poverty alleviation and small-scale fisheries: a review of policy and performance in developing countries since 1950” Chapter 11. Neiland, A.E. and Béné, C. (eds) (2004) *Poverty and Small-scale Fisheries in West Africa*.

3. Performance

3.1. Methodology

Although the outcomes of many fisheries development initiatives have been judged very pessimistically by commentators, there are both positive and negative dimensions to the interventions which have been used in each domain. In order to try to assess and then compare the interventions highlighted in each of the case-studies given in this paper, a simple methodology is used to score six important attributes for each, as follows:

- Technical feasibility – how difficult was it to assess, justify and plan the intervention? (Score 1: Very difficult to Score 4: Not difficult);
- Implementation – how difficult was it to implement and how costly? (Score 1: Very difficult to Score 4: Not difficult);
- Short-term poverty alleviation benefits: Did the intervention help to raise the standard of living of fishers in the short-term? (Score 1: Minor impact to Score 4: Major Impact);
- Long-term poverty alleviation impact: Did the intervention raise the standard of living of fishers in the long-term? (Score 1: Minor impact to Score 4: Major Impact);
- Equity: Were the benefits of the interventions distributed equitably within the fisher communities? (Score 1: Minor impact to Score 4: Major Impact);
- Sustainability: What is the probability that the intervention will generate a sustainable outcome in the longer-term? (Score 1: Low probability to Score 4: High probability).

The attributes shown above are based on the methodology outlined by Conway (1993) for the measurement of agro-ecosystem properties. However, Conway’s method was not directed specifically at poverty assessment. In order to accommodate this dimension, I have included consideration of both ‘short-term’ and ‘long-term’ poverty alleviation impacts (since the timing of benefits received by poor people may be crucial, especially in the case of the extremely poor who will almost certainly need immediate assistance).

For each of the case-study interventions, a total aggregate score was then calculated, as shown in Table 2. This also allowed the interventions to be ranked (Best, Good, Marginal, Weak).

Table 2: Comparison of fisheries interventions

| Case-study | Intervention | Technical feasibility | Ease of implement'n & cost | Impact | | | | Total score (rank) |
|-----------------|-------------------|-----------------------|----------------------------|---|--|--------|----------------|--------------------|
| | | | | Short-term poverty alleviation benefits | Long-term poverty alleviation benefits | Equity | Sustainability | |
| 1. Sri Lanka | New gear | 2 | 2 | 2 | 1 | 2 | 1 | 10 (12) |
| 2. Bangladesh | Stock enhancement | 4 | 2 | 4 | 2 | 2 | 1 | 15 (8) |
| 3. Nigeria | Marketing | 3 | 4 | 2 | 2 | 2 | 1 | 14 (10) |
| 4. Senegal | Credit | 3 | 3 | 3 | 2 | 2 | 2 | 16 (7) |
| 5. St.Lucia | Management | 3 | 4 | 4 | 4 | 4 | 4 | 23 (1) |
| 6. Indonesia | Reallocation | 4 | 3 | 3 | 4 | 4 | 4 | 22 (2) |
| 7. Fiji | Diversification | 3 | 3 | 2 | 4 | 4 | 3 | 19 (4) |
| 8. Bangladesh | Aid | 3 | 2 | 4 | 2 | 2 | 2 | 15 (8) |
| 9. Malaysia | IRD | 3 | 3 | 3 | 4 | 4 | 4 | 21 (3) |
| 10. Nigeria | Valuation | 3 | 2 | 2 | 3 | 2 | 2 | 14 (10) |
| 11. Philippines | CBM | 3 | 3 | 2 | 3 | 3 | 3 | 17 (6) |
| 12. Philippines | Governance | 3 | 3 | 2 | 4 | 3 | 3 | 18 (5) |

3.2 Results

The 'Best Interventions' were (1) Improved fisheries management (Case-study 5: St. Lucia); (2) Re-allocation of fisheries resources (Case-study 6: Indonesia); and (3) Increasing economic growth and diversity (Case-study 9: Malaysia).

Case-study 5: St.Lucia provides an example of a fishery where the fundamental problem of open-access exploitation (and overexploitation) was recognised without much dispute by all the major stakeholders, and an appropriate management response (local level management, focusing on access control, backed by government) was then developed and implemented with the cooperation of all stakeholders (Technical feasibility: 3; Implementation:4). A positive impact on the fishery and its fishers was realised almost immediately (Short-term poverty alleviation: 4; Equity: 4), and it seems likely that that this will be sustained into the longer-term (Long-term poverty alleviation: 4; Sustainability: 4).

Case-study 6: In Indonesia, after many years of conflict between large and small-scale fishers over the use of coastal waters, the government decided to act to resolve the problem by banning trawlers from these areas and re-allocating the resource to small-scale fishers. In terms of technical feasibility and implementation (Score: 4 + 3), the

government acted assuredly in the interests of the larger population of small-scale fishers through a major change in the fisheries management system (Equity: 4), even in the face of political pressure from the industrial fishing sector. While poverty-alleviation impacts did not occur immediately (Short-term poverty alleviation: 3), it has now been recognised that employment has increased in the fisheries and it is expected that these benefits will be sustained assuming that the inshore waters can be managed effectively (Long-term poverty alleviation: 4; Sustainability: 4).

Case-study 9: In Malaysia, the planning and implementation of various integrated rural development schemes by the government agency FELDA (Technical feasibility: 3; Implementation: 3) has had an immediate (Short-term poverty alleviation: 3) and apparently sustainable long-term impact on fisheries, with significant amounts of surplus labour leaving the fisheries to become farmers (Sustainability: 4) There is significant potential for an increase in the standard of living of both the remaining fishers and new farmers (although confirmation is awaited) (Long-term poverty alleviation: 4; Equity: 4).

The ‘Good Interventions’ were (4) Increased performance and diversification in the fisheries (Case-study 7: Fiji); (5) Institutional and policy reform (Case-study 12: The Philippines); and (6) Community-Based Management (Case-study 11: The Philippines).

Case-study 4: In Fiji, the government has recognised the importance of fisheries to the economy and the livelihoods of the coastal fisher communities, and has acted to increase the performance and diversity of opportunities which the fisheries can provide into the future (Technical feasibility: 3; Implementation: 3). The indirect assistance to the fishery sector has stabilised jobs and incomes for some people (Short-term poverty alleviation: 2), and it is hoped that the latest investment in development initiatives will also yield further benefits for more people (although further information is needed to confirm this, since development projects have been variable in performance) (Long-term poverty alleviation: 4; Equity: 4; Sustainability: 3). Potentially Fiji could also extract further resource rent by imposing a higher export tax on the tuna export trade, but so far has chosen not to do this.

Case-studies 11 & 12: In the Philippines, the recent governments have recognised the importance of aquatic resources to coastal people and has attempted to promote greater participation and empowerment of POs through a facilitating environment created by institutional and policy reform (Technical feasibility: 3; Implementation: 3). Although the performance of community-based coastal management schemes is variable (Short-term/Long-term poverty alleviation: 2-4), there have been some notable successes which have helped to raise and maintain the standard of living of increasing numbers local communities (Equity: 3; Sustainability: 3).

The ‘Marginal Interventions’ were (7) Credit schemes in Senegal (Case-study 4); (8) Stock enhancement in Bangladesh (Case-study 2); and (8) International Assistance to Bangladesh (Case-study 8).

Case-study 4: In Senegal, the Savings and Credit Cooperative of Hann (MECH) is an innovative attempt to provide various financial services to all members of this local fishing community (Technical feasibility: 3). However, its performance has been variable. On the positive side, it has involved a large proportion of the community in its activities and loans made available to small-scale fishers has enabled them to expand and diversify their livelihood activities (Short-term poverty alleviation: 3). On the negative side, the overall operation of the facility is constrained by a lack of experienced personnel, a high default rate and an apparent inability to expand the operational base (which restricts the number and size of loans) (Implementation: 3). The existence of other informal ('traditional') financial systems, which operate in parallel to the MECH is a major complication and constraint, and threatens the future access of small operators (Equity: 2) and the overall sustainability of the system (Sustainability: 2; Long-term poverty alleviation: 2).

Case-studies 2 & 8: In Bangladesh, the feasibility assessment and implementation of large-scale fisheries enhancement have been fairly effective through the cooperation of the government and international agencies (Technical feasibility: 3-4; Implementation: 2) leading to poverty-alleviation outcomes in the short-term for many rural people (Short-term poverty alleviation: 4). However, the long-term flow of benefits (Long-term poverty alleviation: 2) and the overall sustainability of these interventions can be questioned: the poor in Bangladesh do not have access rights to the best fisheries (Equity: 2), the State agencies lack capacity for management and it is uncertain whether the technical and financial assistance received from foreign donors will continue into the future (Sustainability: 1-2). Although it seems likely that food security through integrated rural development and increased food production are the initiatives which will probably absorb greater amounts of international assistance in the future.

The 'Weak Interventions' were (10) Improved marketing in Nigeria (Case-study 3); and (10) Valuation of the fisheries sector in Nigeria (Case-study 10); and (12) Improved gear in Sri Lanka (Case-study: 1).

Case-study 3: In Nigeria, although the technical feasibility and implementation aspects of this intervention appeared to be relatively straightforward (Technical feasibility: 3; Implementation: 4), the impact on poverty alleviation (Short/Long-term: 2+2), equity (Score: 2) and sustainability (Score: 1) have been weak. The innovations and changes to fish marketing which the project sought to achieve were not accomplished in the long-run – fishers have not organised themselves and remain under the control of local merchant-middlemen, fish-processing techniques remain the same, including large post-harvest losses. The fishing communities remain highly stratified between rich and poor.

Case-study 10: In Nigeria, analysis of the impact of the use of information relating to the value of the fisheries is complicated. The dam constructed in the Hadejia-Jam'are river system was expected to generate net economic benefits on a national level through up-stream irrigated agriculture. Regarding the fisheries sector (inland fisheries are exploited as part of a fishing-farming floodplain system in this region), it was expected that the downstream fishing-farming system could be modified and changed (e.g. more irrigation;

new management regimes in-line with dam-water release schedules) as part of the overall plan (Technical feasibility: 3). However, implementation of these plans has proved to be problematic (Score: 2). Overall, the impact of the dam schemes on the local downstream fishing communities has been weak (Short-term poverty alleviation: 2; Equity: 2; Sustainability: 2), although in the longer-term, if the dam can be managed more effectively and the regional economy stimulated by this, the impact could be more positive (Long-term poverty alleviation: 3). At the present time, it seems likely that the downstream floodplain benefits (e.g. farming-fishing) which have been foregone with the construction of the dam, have not been compensated by greater global benefits through irrigation upstream.

Case-study 1: In Sri Lanka, the attempts to promote new boats and gears in the southern fisheries were not successful at all. The gear was inappropriate for the local fisheries (Technical feasibility: 2), with fishers finding it difficult to use and adapt to the new gear. The gear also proved expensive to buy (without loans/credit) for poor fishers and costly to replace (Implementation: 2). Overall, the majority of fishers did not benefit from the introduction of the new gear, many getting into debt and increased dependence on wealthy traders (Short/Long-term poverty benefits: 1-2; Equity: 2; Sustainability: 1). However, in the north, where technological interventions were not promoted by government, local fishers have adopted and adapted newly available gears to their existing fishing practices with considerable success

APPENDIX 3

Table 1: A profile of the Inland Fisheries of Africa

| Key element | Overview | |
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| | Global overview and specific to African inland fisheries | References |
| 1. ENVIRONMENT | | |
| 1.1. Ecosystems | <ul style="list-style-type: none"> • <u>Global overview</u>: Importance of relationship between fisheries and ecosystems has long been recognised; concern grows publicly over negative trends such as pollution; there is slow progress in adopting an ecosystem approach to fisheries management; ecosystem research is challenging and there is much to be done with reference to fisheries; • <u>Africa</u>: 12 large river basins which cross geological and climatic zones, and shared by different countries; except for Sahara and other desert regions; • Rivers vary in length and size; from largest (Nile, Congo, Niger) to small headwater streams and tributaries; associated with seasonal flows and creation of floodplains (important for feeding/breeding cycles of fish); complex river regimes; • Lakes also vary in size/form; from large, stable bodies e.g. Lake Victoria and other Rift Valley Lakes, and large fluctuating water bodies e.g. Lake Chad; to numerous smaller bodies and floodplain lakes; • Ecosystems are highly productive; show high seasonality (rivers flood, then dry) due to variations in rainfall; levels of most big rivers rise/fall through 20m or more (reduce potential for river traffic; good potential for hydro-electricity and dam construction); seasonal water shortages throughout Africa has encouraged schemes to manage flows and divert rivers; also irrigation schemes; • Status of knowledge: Relatively low; peak research effort was in 1970s/80s; today some bi-lateral and GEF projects on lakes and rivers; some national initiatives; lack of continuity and records in general; some systems almost unknown (e.g. Congo); | <ul style="list-style-type: none"> • FAO (2002, 2004) • Van den Bossche & Bernacsek (1990); • Welcomme (1989); • Dodge (1989); • Beadle (1974; 1981) • Grove, (1971; 1985); • Beadle (1974; 1981); • Adams (1992) • Welcomme (2005); • Welcomme and Halls (2004) |
| 1.2. Fisheries Resources | <ul style="list-style-type: none"> • <u>Global overview</u>: Status of world fisheries resources review undertaken regularly by FAO since 1980; in 2002, over 50% of world's fish stocks are fully or overexploited; trends show continuing decline in marine fish stocks; inland resources threatened by environmental changes and over-fishing (accurate assessments not widely available); aquaculture continues to develop and expand; • <u>Africa</u>: Total of no. inland fish species in Africa: 2000 • Fish stocks exploited are multi-species, diverse, with complex interactions; also a variety of adaptations to environment including extensive migrations for some fish; • Fish productivity estimates vary from lakes, rivers, and floodplain environments; • A key issue is the relationship between fish stock productivity and composition, and the changing nature of aquatic environment (under climatic and man-made changes e.g. dams; pollution); excessive fishing pressure current major problem; dams, river management is major issue for future; • Fishing effort in Africa has doubled for 10 year period 1985-1996 and most inland fisheries are intensively exploited; • Introduction and Enhancement: Africa least affected by species | <ul style="list-style-type: none"> • FAO (1995; 1996; 1998; 2000; 2002, 2003; 2004) • Lowe-McConnell (1987) • Durand (1983); Quensiere (1995) • Welcomme (2005) • Dunn (1989), Molsa (2002); Welcomme (2005); Lae (2004); Brummet and Teugels (2004); • FAO (1996) • FAO (1998) |

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| | <p>introductions (430 recorded); high profile are Nile Perch in Lake Victoria; Kapenta in Zambezi River Reservoirs; impact of Tilapias for aquaculture on river stocks is unknown;</p> <ul style="list-style-type: none"> • Overall status of knowledge: Localised and largely out of date for rivers; research has focused on Great Lakes, and Chad Basin in recent years, but still depends on external projects; | <ul style="list-style-type: none"> • Welcomme (2005) |
| <p>• TECHNOLOGY AND SECTOR STRUCTURE</p> | | |
| 2.1. Types of fisheries | <ul style="list-style-type: none"> • <u>Global overview</u>: Broad range and diversity of fisheries and fisheries technology exists worldwide including industrial, semi-industrial and artisanal or non-industrial; catch utilisation varies with market demand; mainly for human consumption, especially in developing countries; • <u>Africa inland</u>: Most common are artisanal or non-industrial: low level of capital invested, low technology, low level of modernisation, high labour input, low fuel energy consumption, low discard rate; • Fishing and other onshore activities often integrated with farming and other activities; most fishers are part-time; full-time professional fishers less common; • Sector structure varies; in some fisheries distinction between fishers, fish processors, fish traders, fish sellers; in others not so; men tend to fish; women tend to operate on-shore activities; • High diversity of fishing gears and fishing practices adapted to fishery environment, and abundance and seasonality of target fish; traditional fisheries often well-organised (communally), based on local knowledge, integrated in local culture, and using sophisticated traditional gear designs; fish processing and product transportation and trading practices adapted to low conditions (mainly dried and smoked products in sacks/boxes for regional trade; fresh fish locally); • Traditional fisheries are vulnerable to change in many parts of Africa; modern gears, commercialisation and changing social relations (elite capture of rich fisheries is common); • Few industrial fisheries (e.g. some trawlers on Lake Malawi); little industrial processing except for international commercial trade in Nile Perch from Lake Victoria; • While there have been some localised, detailed studies/surveys of fisheries, overall, knowledge is limited; especially the nature and impact of change in the fisheries; | <ul style="list-style-type: none"> • FAO (2002, 2004) • FAO (2002, 2004) • Bene et al. (2003); • Medard et al. (2002); • Durand (1983); • Neiland (2005) • Durand (1983); • Quensiere (1995); • Neiland et al. (2002); • FAO (1996); • Hara et al. (2002) |
| 2.2. Fishing fleets | <ul style="list-style-type: none"> • <u>Global overview</u>: World fleet is 3.8 million vessels (20 million GT); 2/3 undecked and <10 m length; 80% fleet in Africa is undecked and overall fleet size is increasing; • <u>Africa inland</u>: Fishing vessels are mainly canoes (various sizes); some motorisation (mainly outboards); very few decked vessels; many fisheries do not use fishing canoes, and depend on fishing gears operated from river banks/lake shores (e.g. barrier fishing traps); • Modern materials increasingly used and adapted to local craft and gear designs (e.g. GRP boats, nylon nets); many governments have allowed tax-free gear imports, and also distributed subsidised gear to fishermen as part of government policy to increase production; | <ul style="list-style-type: none"> • FAO (2002, 2004) • FAO (2002, 2003, 2004) • FAO (2002, 2003, 2004) |
| <p>• ECONOMICS</p> | | |
| 3.1. Fisheries | <ul style="list-style-type: none"> • <u>Global overview</u>: In 2000, capture fisheries production | <ul style="list-style-type: none"> • FAO (2002, 2004) |

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| production | <p>reached 94.8 million tonnes (highest ever); expected future trend is decline in landings; estimates affected by China and pelagic stock fluctuations; Total production highest from developing countries (62 million tonnes); Total aquaculture production growing (46 million tonnes at present); Total inland fisheries production was 8.7 million tonnes;</p> <ul style="list-style-type: none"> • <u>Africa</u>: In 2001 total estimated landings from African inland fisheries were 2.1 million tonnes (24% total global inland fisheries production); • Major national producers in Africa were: Egypt (293,000t [3.3%]); Tanzania (274,000t [3.1%]); Uganda (222,000t [2.5%]); Congo DR; Kenya; Nigeria; Mali; • Major fisheries included: Lake Victoria (500,000t), River Congo Basin (520,000t), River Nile Basin (???); River Niger-Benue Basin (236,000t), Chad Basin (100,000t); • Total annual production is estimated to be increasing by 2% p.a. (based on 1984-1996 data); • As a proportion of total catches, inland fisheries landings have grown from <25% (1951) to 49% (1999) • In general, fisheries statistics are weak and national production estimates should be treated with caution; | <ul style="list-style-type: none"> • FAO (2003, 2004) • FAO (2003) • FAO (2003); LVFO (1999) • FAO (1996, 2004, 2004)) |
| 3.2. Fisheries production values (financial values) | <ul style="list-style-type: none"> • <u>Global overview</u>: In 2000, the first sale value of capture fisheries production was US\$81 billion; • <u>Africa</u>: In 2001, the first sale value of inland fisheries production in Africa was estimated at US\$1,823 million; • First sale value of production by major producers is not available comprehensively; some examples: • Nigeria: 130Kt/yr (US\$180 million); Mali: 100Kt/yr (US\$350 million); Export values from Lake Victoria: Tanzania: US\$200 million (1998); Kenya: US\$80 million (1998); Uganda: US\$77 million (1994); • First sale value of production by major fisheries is also not available comprehensively; some examples: Lake Victoria (US\$ 600 million/yr); River Niger-Benue Basin (US\$95 million/yr); River Congo Basin (US\$208 million/yr); | <ul style="list-style-type: none"> • FAO (2004) • Neiland and Bene (2005) • LVFO (1999) |
| 3.3. Economic values | <ul style="list-style-type: none"> • There is very limited economic data on African inland fisheries; • From West/Central Africa only two studies: Hadejia-Jamare Wetlands: Net economic benefits from fishing was US\$9 million/yr (or US\$90/ha/yr); NE Nigeria inland fisheries valued at US\$6 million/yr; • In East/Southern Africa a variety of case-studies have been undertaken. For example: Rufiji Floodplain and Delta, fish and shrimp (11K t/yr) with net economic vale of US\$7.40 million; Zambezi Delta, fish and shrimp catch (16Kt/yr) with a net economic value of US\$5.37 million; | <ul style="list-style-type: none"> • Barbier et al. (1991); • Neiland (1997) • Turpie et al. (1999) |
| 3.4. Fish trade | <ul style="list-style-type: none"> • <u>Global overview</u>: In 2000, global trade in fish and fishery products increased to export value of US\$55 billion (+8% since 1998); prices dropped but volume increased; Main markets are Japan, Europe, N. America; Main suppliers: Developing countries; Fish is the most valuable export commodity and source of FOREX; Major issues for future: quality control regulations, public concern over sustainability; traceability and labelling; • <u>Africa</u>: Inland fisheries have become integrated within fish trade systems, with significant levels of commercialisation in many cases; the fish trade provides an opportunity for livelihood diversification and support, and the possibility of | <ul style="list-style-type: none"> • FAO (2002, 2004) • Delgado et al. (2004) • FAO (1996) |

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| | | <p>generating cash (often for use in other activities such as farming);</p> <ul style="list-style-type: none"> • Some major fisheries, such as Lake Victoria, are involved in international fish trade, with Nile Perch (500,000 tonnes, US\$600,000) sent to markets in Europe, N.America and Japan mainly; • A majority of inland fisheries in Africa are involved in regional, national and local trade, often on an informal basis (does not appear in national records or accounts); usually involving dried or smoked fish products produced by local/artisanal processors; and traded over hundreds of miles through well-developed marketing chains; • Factors which have led to the development of regional/national trade in recent times include: high demand from expanding urban markets; high cost of other protein food alternatives; better roads and transport; interest and investment from local entrepreneurs and activities of merchant class; • At a local level, trade in fresh and processed fish occurs; often in areas where road infrastructure limits a more long distant trade; • In general, there is a patchy knowledge of the trade and marketing of inland fish products; some systems are known better than others (e.g. Lake Victoria; parts of the River Niger; and the Chad Basin), based largely on a series of external research and development projects; very little knowledge of the informal fish trade in Africa in general, other than some detailed observations on products, routes and trends; nature of social relations, and benefit distribution is hardly understood; | <ul style="list-style-type: none"> • LVFO (1999) • Durand (1983); • Neiland (2005) |
| | 3.5. Fish supply and consumption | <ul style="list-style-type: none"> • <u>Global overview</u>: Total food fish supply for world (excluding China) has been growing at a rate of 2.4% p.a. since 1961; while population has been expanding at 1.8% p.a.; • Per capita supply has increased to: LIFDCs (8.3 kg/yr); Developing Countries excluding LIFDCs (14.8 kg/yr); • Globally most inland capture fisheries countries have per capita inland capture fisheries values of <2.5 kg/person; • Top 20 countries for inland capture fisheries include (1) Cambodia (28 kg/capita); (2) Chad (9 kg/capita); (3) Uganda (8 kg/capita); (4) Mali (8 kg/capita); (5) Congo Republic (7.5 kg/capita); (6) Gabon (7.5 kg/capita); (7) Tanzania (7 kg/capita); (10) Zambia (7 kg/capita); (13) Kenya (6 kg/capita); (15) Benin (6 kg/capita); (17) Egypt (5.5 kg/capita); (18) Central Africa Republic (5 kg/capita); (19) Malawi (4.5 kg/capita); (20) Congo DR (4.5 kg/capita); • <u>Africa</u>: Inland fisheries make an important contribution to total food supply; (relatively more than in Asia); • Inland capture fisheries are particularly important in African landlocked countries where aquaculture production is minimal; • Although there are very little data, it is assumed that a high proportion of fish supply from inland capture fisheries is for direct human consumption; | <ul style="list-style-type: none"> • Delgado et al. (2004); • FAO (2004); • FAO (2003) |
| | 3.6. GDP contribution | <ul style="list-style-type: none"> • For most countries fisheries is <1% GDP; some countries in Africa it is >1% Ghana, Mauritania, and for inland fisheries >1% for Mali, Chad, Uganda; | |

| • 4. SOCIAL ASPECTS | | |
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| 4.1. Employment and livelihoods | <ul style="list-style-type: none"> • Global overview: In 2000, 35 million people were directly engaged in fishing and aquaculture (in 1990, 28 million); Including both full-time and part-time workers; Equals 2.6% global agricultural workforce; Asia largest share (30 million), then Africa (2.6 million) and S. America (1 million); Workforce share closely reflect the different population share and relative predominance of labour intensive economies; • Africa: Inland fisheries are an important source of employment many regions; including a full range of activities (fishing, processing, gear-making, transportation); • Inland fisheries often form part of an integrated livelihood approach, usually with agriculture (part-time fishers), especially in major floodplain and wetlands (e.g. Niger Delta, Chad Basin); risk-spreading through diversification; • Inland fisheries can often provide a source of cash, for re-investment in other activities such as farming; • In-migration to fisheries is increasingly in many parts of Africa, as a result of the weak performance of other sectors, especially agriculture; this has led to conflict between resident fishers and new arrivals, as the former attempt to defend their ownership of fishing grounds; | <ul style="list-style-type: none"> • FAO (2002, 2004) • Durand (1983); • Quensiere (1995); • Remane (1997); • Neiland and Bene (2004); • SFLP (2000, 2001); |
| 4.2. Nutrition | <ul style="list-style-type: none"> • Global overview: Total amount of fish and type consumed vary by region and country reflecting the different levels of natural availability, food traditions, demand and income; Fish generally provides 20-30 calories per capita per day (180 in Japan and Iceland); World-wide more than 1 billion people rely on fish as an important source of animal protein; global average fish protein supply: 4.4g/capita/day; • Africa: Average fish protein supply (g/capita/day) is 2.4; compared to S. America (2.4) and Asia (4.8); • Fish proteins are essential and critical in the diets of some countries where the total protein intake may be low; fish (both inland and marine) contributes more than 50% of total animal proteins in the Gambia, Ghana, Equatorial Guinea, Sierra Leone, Togo, Guinea, and DR Congo; For Mali, Chad and East Africa almost all the fish consumed is from inland sources; • Overall, there are relatively few investigations examine the role of fish in nutrition in Africa; | <ul style="list-style-type: none"> • Kent (1987); • FAO (2002, 2004) • FAO (2003) |
| 4.3. Socio-economics relations and poverty | <ul style="list-style-type: none"> • Global: for many decades, it has been assumed that poverty is endemic in fishing communities, and that in developing countries, small-scale fishing communities (both inland and marine) represent some of the most disadvantaged parts of rural society; it has also been widely asserted that ‘fishers are the poorest of the poor’ (coupled with ‘fishing as the activity of last resort’); various explanations have been given including low catches due to lack of gear, low catches due to overexploitation (unmanaged fisheries) and lack of alternative employment; many fisheries development policies focused on increasing catches (technology-based productionist approach); • Africa: An increase in socio-economic and poverty-related research has helped to increase understanding and broaden the debate over fisheries development; important findings include: • Fishing communities (like other rural communities) tend to be heterogeneous – with rich, middle and poor strata; • Fisheries are often not the activity of last resort, and form an | <ul style="list-style-type: none"> • Platteau (1989); • Horemans (2004); • Bene (2003); • Neiland and Bene (2004); • Jallow and Njie (2004) |

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| | | <p>integral and often profitable part of household livelihoods;</p> <ul style="list-style-type: none"> • Fisheries are often capable of generating significant wealth (when well-managed and/or linked to effective market systems); • The ownership and control of these valuable resources, and the way in which wealth is generated and distributed (or not) will have a major impact on the socio-economic profile and the level of poverty of a community or region; • In the past, traditional management systems probably included a greater degree of wealth-sharing than more contemporary systems (which are often captured by elite groups with little link to the local culture or moral economy); • It is increasingly recognised that poverty is a complex phenomena which includes low income, lack of education, social exclusion, entitlement failure, vulnerability to shocks, and political powerlessness; approaches such as poverty profiling and the sustainable livelihoods approach are useful tools in this research; • In fishing communities, poverty amongst different actors (individuals/ households) is often less related to Malthusian crisis (lack of available food, commodities and services), but more related to entitlement breakdown (failure to access food, commodities and services); • Understanding poverty in fishing communities therefore requires a good understanding of social structures, social relations and politics, and patterns of change, particularly in relation to entitlements; • There have been some detailed studies for inland fisheries (N.Nigeria, Chad Basin, various other in West Africa, Lake Victoria), but further work and greater coverage is needed to enable an effective contribution to fisheries development policy in the future; | |
| <p>• 5. POLICY AND MANAGEMENT</p> | | | |
| 5.1. General global trends | <ul style="list-style-type: none"> • Fisheries policies and management are in state of flux, with increasing recognition of the need for sustainable development and use; • Management efforts are increasingly complicated by other activities – urbanisation, water management and control, deforestation, agricultural activities and industrial wastes; • There is a need to develop management systems which cope with competing uses and within an ecosystem context; • Intensive use of fisheries resources will require allocation mechanisms between different stakeholders, and conflict management; • There needs to be a re-consideration of management approaches to date, and to incorporate multi-disciplinary and multi-objective approaches; | <ul style="list-style-type: none"> • FAO (2002, 2004); • USAID (2004); • World Bank (2004); • Cunningham and Bostock (2005); | |
| 5.2. Fisheries Policy | <ul style="list-style-type: none"> • Fisheries often have not been a priority for many countries in terms of development policy and investment (there are exceptions including: Ghana, Malawi, Uganda.); • The role and contribution of fisheries to sustainable development has been underestimated and undervalued in many cases; fisheries has often been seen as a minor sub-set of agricultural policy; • Fisheries policy has remained static in many African countries, with few major revisions of policy documents established at the time of Independence; in some countries, it | <ul style="list-style-type: none"> • Alison et al. (2002); • Geheb and Sarch (2002) • Neiland et al. (2002); • Payne (2000); • Platteau (1989); • RDI (2000); • Thorpe et al. (2004); | |

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| | | <p>has been modified (e.g. Nigeria) or even changed radically (e.g. Mali) in recent years;</p> <ul style="list-style-type: none"> • Fisheries policy often has multiple objectives including resource conservation, preservation of bio-diversity, contribution to the rural economy and employment, supply of domestic food markets, and contribution to international trade; • The policy process (design and implementation of policy) is based on decision-making controlled by government officials, often with minimal interaction or consultation with local level organisations or actors; • Fisheries policy and the policy process tend to be underpinned by policy narratives which emphasise production maximisation as the way to meet policy objectives; little consideration of alternative narratives relating to social or economic domains; • In general, the literature indicates that policy performance in fisheries for African countries has been weak, with a failure to meet many of the objectives set; • The policy process (design and implementation) itself has been constrained by limited and declining government institutions with weak capacity to pursue their original mandate; a weak and inappropriate legal system; and a lack of political support for new investment (or sometimes for agreed re-current investment, with funding shortfalls and interruptions limiting policy implementation); • The possibilities for improved policy development have also been constrained by the weak institutional setting (which is especially complicated for shared basins), the stagnation of policy around a narrowly-focused technical/biological approach, and a failure to clarify the links between fisheries policy and sustainable development (value/role, ability to generate sustainable wealth and contribution to pro-poor growth); | |
| | <p>5.3. Fisheries Management</p> | <ul style="list-style-type: none"> • In a majority of African countries, fisheries management is the responsibility of a state fisheries department; often part of a larger state administration covering agriculture, natural resources and/or rural development; • The state fisheries department is mandated to implement national fisheries policy, and is underpinned with a legal framework; • The state fisheries department is allocated a budget (from national budget) to carry out its functions – information-gathering (links with research institutes), analysis and planning, resource allocation, setting and enforcement of rules and regulations, and general administration of all aspects of the fisheries sector; • Management systems in Africa tend to have a centralised organisation, with a director of fisheries controlling regional and local officers, who enforce regulations and feedback information; • The objectives of the management systems often focus on the maximisation of fisheries production, with reference to MSY (based on stock assessment knowledge), and based on a system of regulations to control fishing effort and gears used; • In many fisheries, state fisheries departments also try to enforce a system of licences, and collect revenue from fishers, and traders – in some cases these funds are required to be returned to central government (national exchequer), in others, the funds should be used to fund the fisheries management system and/or fishing community projects; | <ul style="list-style-type: none"> • Doulman (2004); • Hara et al. (2002); • Jallow and Njie (2004); • Neiland and Bene (2003) • Reynolds et al (2002); • LVFO (1999); • Satia et al. (2004); |

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| | | <ul style="list-style-type: none"> • In general, the literature indicates that the national fisheries management systems which have been applied to inland fisheries over the past 40 years have not performed well – various indicators show that MSY is not being achieved, fish stocks are increasingly threatened by overexploitation; fishing pressure is increasing, and that many systems operate under conditions of open-access (de facto); • State fisheries management systems have been constrained by a lack of funding and political support, a lack of staff, low levels of expertise, and logistical and technical problems; • In some parts of Africa, fisheries appear to operate effectively under the control of traditional community-based management systems; • In recent years, the weak performance of state fisheries management systems has led to an increased search for alternative approaches – resulting in proposals and programmes for co-management and/or community-based management; however, the performance of fisheries co-management systems for inland fisheries, to date, has also been variable, and this suggests that there is still much to learn; • Other views see a need to go right back to the design of fisheries policy and to re-orient policy objectives, to have a clear focus on wealth generation and pro-poor growth, and to then design management systems to meet these new objectives – an emphasis on fisheries within a broader development policy approach (which is compatible with a livelihoods approach); | |
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