Incorporating Fish Market and Trade Information into Policy-Making for Sustainable Livelihoods and Poverty Reduction:

Methods and Lessons from the Lake Chad Basin

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ABSTRACT

In the following report, the use of fish market and fish trade information in the policy process for sustainable livelihoods and poverty is explored. The empirical findings of the 'Study of the Contribution of Fish Marketing to Livelihoods in the Countries of the Lake Chad Basin or LCB (Cameroon, Central African Republic, Chad, Niger and Nigeria) (2002-2004)', part of the DFID/FAO Sustainable Fisheries Livelihoods Programme (SFLP) were used as a basis. There are six sections: first, a brief overview of the national and regional context of the LCB; second, the history of the LCB fish trade from 1800 is reviewed, with particular reference to methods of investigation and monitoring; third, the methodology used to characterise the current LCB fish markets and trade is outlined; fourth, the characteristics of the LCB fish markets and trade are presented; fifth, an assessment of the methodology for investigating and monitoring the LCB fish markets and trade is given; and sixth a set of conclusions and recommendations are provided. The current study highlights the importance of the regional, and often informal, trade in LCB processed fish (119,000 tonnes/year valued at US$54 million), and the benefits which it provides, mainly through underpinning the livelihoods of thousands of people. The study also demonstrates the possibilities for fisheries monitoring and analysis, based on a relatively simple 3-part information system which incorporates trade monitoring (in markets and along roads); stakeholder analysis and policy analysis. Most importantly, it is 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 study 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.

Key words:

Fisheries; Policy; Livelihoods; Markets; Trade; Information Systems; Africa;

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1. INTRODUCTION

The eradication of poverty is widely recognised as one of the greatest challenges facing mankind today (World Bank, 2000). In response a wide range of national and international programmes have been put in place to address the underlying causes. While poverty is recognised as being multi-dimensional in nature, a central theme of international policy is 'how to improve national economic performance in order to increase people's welfare' (Meier, 1995). This is, of course, one of the major themes which has tasked economists and policy-makers worldwide for hundreds of years, and there is still much debate and discussion over the best approach under specific conditions. The development record of the past fifty years, in particular, allows an examination of why some countries have performed better than others.

Unfortunately, many African countries have shown low levels of economic development and an increasing level of poverty during this period, and this is a great source of national and international concern. Within this context, many economists have emphasised the importance of putting in place the right policies which allow economies to function effectively, and in particular to harness the market mechanism, and the potential benefits of international trade and globalisation (Gabre-Madhin, 2002; DFID, 2004; DFID/PASS, 2004).

The literature on the linkages between economic development and trade and markets is very extensive, and in turn this helps to underpin an increasingly sophisticated international understanding of, and debate over macro-economic policy. However, there are also important gaps which need to be addressed, if economic development policy is to tackle poverty effectively in the future, particularly in Africa. Three important issues concerning the linkages between economic development, trade and markets in Africa, which are now receiving more recognition are:

Box 1: Market and trade issues in Africa

- the general lack of understanding of how markets in Africa work (it has been assumed that all markets are very similar worldwide);
- the importance of 'informal' economic activities (they have been undervalued, and may contribute more to GDP than formal economic activities);
- the role of regional (within Africa) trade, as opposed to international trade (informal regional trade is probably more important than international trade for many African countries);

Ref: Fafchamps (1997); Tripp (2001)

In the following paper, the importance of 'trade' and 'markets' for the livelihoods and welfare of people in West Africa will be examined using the fisheries sector as a case-study. To be more specific, results of research work over the past 10 years which has investigated the important trade in processed fish from the Lake Chad Basin (LCB) will be reported and discussed. This includes a historical perspective of the LCB fisheries and fish trade since 1800 (the earliest records).

The course which the research has taken is interesting in itself, and it might be termed an 'inductive process'. It started out originally as a simple exercise in the statistical monitoring of local fisheries some years ago (see Neiland, 1997), but then developed into a much more broad-based investigation which raised some very fundamental questions about policy interventions for poverty reduction related to trade. It was also intended to contribute to knowledge about fish marketing in general (see Garruccio, 1995). In effect, the three fundamental questions which the fish trade research in the Lake Chad Basin has tried to address are summarised in Box 2 below:

Box 2: Research questions for the Lake Chad Basin fish trade

(i) How important is the fish trade for livelihoods and poverty reduction?
(ii) Has policy performed well in this area, and what are the key policy issues?
(iii) What are the future priorities for policy development for the fish trade?

The objective of this paper is therefore to examine these three questions, to explain the approaches which have been used in the LCB to investigate the key issues involved, and to highlight some of the main findings. Particular emphasis will be placed on explaining the study approaches which have been used in recent studies, combining trade monitoring, participatory methods and policy analysis. There are six sections to follow. First, a brief overview of the national and regional context of the LCB is given. Second, the history of the LCB fish trade from 1800 is reviewed, with particular reference to the methods of monitoring and investigation which have been employed. Third, the methodology used to characterise the contemporary LCB fish markets and trade is described. Fourth, the characteristics of the contemporary LCB fish markets and trade are described based on empirical research findings, and the key policy issues identified. Fifth, the possibilities for using fish market and trade information in the policy process in the future are examined, including the identification of priorities for action. A sixth section presents a set of conclusions.

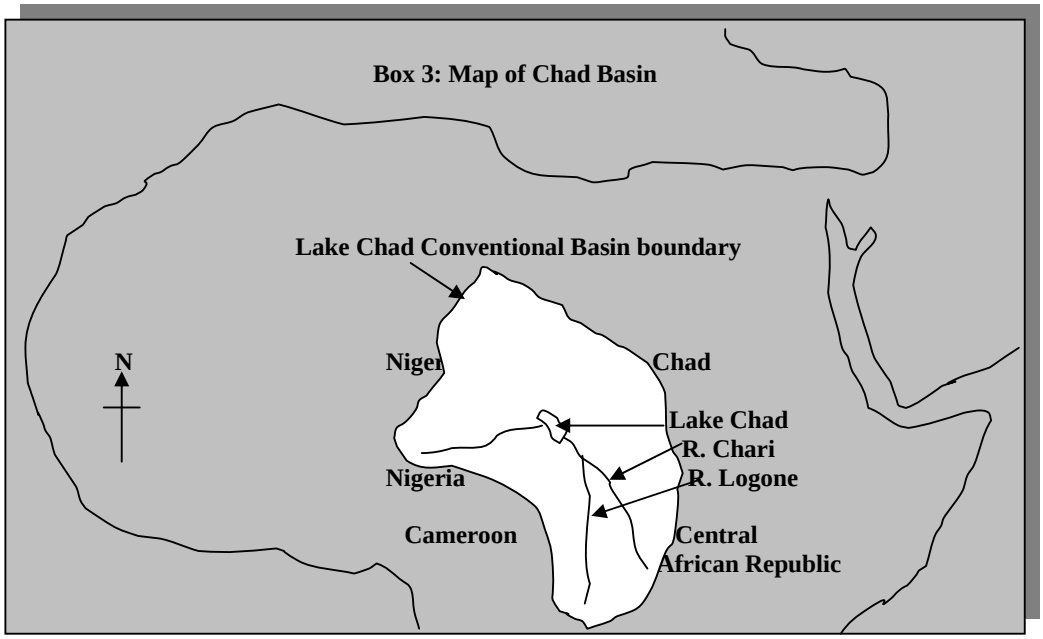
2. NATIONAL AND REGIONAL CONTEXT OF THE LAKE CHAD BASIN

In the following section, the national and regional context of the Lake Chad Basin is described briefly.

The Lake Chad (hydrological) Basin covers an area of 2.43 million sq.km in central Africa and spans a range of climatic and vegetation zones from tropical forest in the south to the Sahara Desert in the north. The Lake Chad Conventional Basin (the focus of this paper) covers a smaller area of 987,000 sq.km, as agreed by the five riparian countries which signed the (new) LCB Convention (1994) – Cameroon, Central African Republic, Chad, Niger and Nigeria. It is centred on Lake Chad, the rivers Logone and Chari, and the associated fringing floodplains (Box 3). The total population of the LCB (Conventional) is 36 million people (Box 4). The majority participate in a regional economy which is based on rural agriculture (cattle, crops, and

fishing). The fluctuating climatic and hydrological conditions which are a characteristic of the LCB also means that the farming systems have become

Box 3: Map of Chad Basin



Box 4: Profile of the riparian states of the Lake Chad Basin (using most recent data)

	Cameroon	CAR	Chad	Niger	Nigeria
Area (000s sq. km)					
Total					
LCB (%)	48	216	1,123	675	179
Population (millions)					
Total	14	3	7	10	120
LCB	2	1	8	2	23
Economy					
GDP					
GDP/capita	1,573	1,166	850	753	853
Growth rate					
Health & Education					
Life expectancy (yrs)	50	43	48	46	47
Infant mortality (per 1000 live births)	76	96	101	114	84
Undernourishment (% population)	19	41	38	46	8
Adult illiteracy (% age 15 and over)					
Male	18	40	48	76	28
Female	31	65	66	92	44
Poverty & HDI					
Below poverty line (%)	40	67	64	63	34
Below $1/day (5)	32	66	n.a.	61	70
HDI Rank	125	154	155	161	136

Source: Neiland & Bene, 2002; UNEP (2004)

adapted to try to cope with a high level of risk and uncertainty. For example, rural households often integrate farming and fishing activities in order to minimize the risk to their livelihoods.

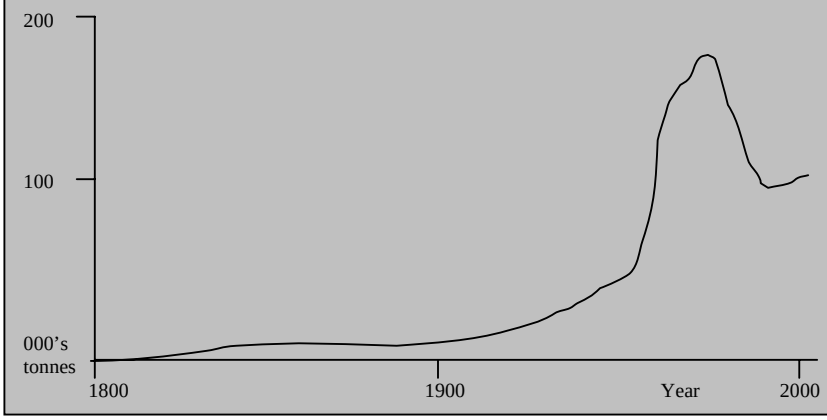
However, the LCB is also remote and largely under-developed in a modern sense. The Lake Chad Basin Commission has attempted to coordinate development policy between the riparian countries for the region, but progress has been slow, and there have been comparatively few major development interventions. In general, the population of the LCB does not have widespread access to clean water, education or health services, and there is a high level of poverty. The region has also suffered from the effects of war and civil unrest. The five LCB riparian countries are relatively 'weak states' (i.e. they exhibit weak governance) and are placed low on the Human Development Index.

For the most up to date overviews of the LCB, see Neiland and Bene (2002), Batello *et al*. (2004) and UNEP (2004).

3. OVERVIEW OF LCB FISH MARKETS & TRADE STUDIES 1800-2004

The contribution of fisheries and the trade in fish to the LCB regional economy has been widely recognised for a long time. Although comprehensive information and statistics are not generally available, it is possible to trace the history and development of this important sector since the beginning of the nineteenth century by using various sources. It is also interesting to note the approaches which have been used by both government authorities and researchers to investigate and document relevant information, and to consider how these approaches might inform the policy process in the future. The total quantity of fish traded each year in the LCB is shown in Box 5 based on estimated values. Over the course of this history, at least four stages can be identified and characterised. These stages are summarised in Box 7 and explained more fully below.

Box 5: Fish trade in the Lake Chad Basin, 1800-2004 (estimated, wet weight)



Pre-colonial period (1800-1900)

*D*uring this period, the LCB was divided-up into various small kingdoms. The most prominent was Bornu (surrounding Lake Chad), which bordered

Hausaland (modern northern Nigeria), at that time part of the larger and more powerful Islamic Sokoto Caliphate. There is relatively little information in existence about the fisheries at this time, and the total fish trade was probably less than 1,000 tonnes per year. However, Redmond (1976), who researched through the national archives of Nigeria in Kaduna (which includes the records of colonial district officers, for example), and also undertook work on oral traditions (Box 6).

Box 6: Inland fisheries in nineteenth century West Africa

'…fish resources have long been exploited by societies in the region for both internal consumption and export…the main fishing groups [were] the Sorko, Kede and Kakanda on the Niger, the Wurbo and Jukun on the Benue, and the Buduma and Bede on Lake Chad. Groups among numerous other societies also fish'

Source: Redmond (1976)

Sutton (1976), who also studied rural northern Nigeria, indicates that fishing and other forms of livelihood activity were not mutually exclusive, and many fishing communities also farmed and traded. It has been suggested that during this pre-capitalist period that rural communities in the LCB had learned to cope with environmental risk (Watts, 1984). They developed an adaptive flexibility and adjustment capability to deal with drought, variable harvest and food shortages. Scott (1976) has suggested that pre-capitalist societies were to a large degree organised around the problem of risk and the guarantee of a minimum subsistence, a margin of security. He also called this a 'subsistence ethic' which can be divided into three aspects: a general proclivity towards risk aversion in agriculture ('safety first'), a tendency towards mutual support ('the norm of reciprocity'), and an expectation of minimum state support ('the moral economy'). Overall, Watts (1984) emphasizes that security arrangements (for livelihoods and food security) were grounded in and inseparable from the architecture of the entire social formation and instrumental to its reproduction. The LCB fisheries and the fish trade, albeit small, were undoubtedly an integral component of these arrangements.

Colonial Period (1900-1960)

The LCB was divided-up between the Anglo-phone (Nigeria) and Franco-phone (Cameroon, Central African Republic, Chad and Niger) Empires during this period. Once again, there is relatively little information about the fisheries and the fish trade except for some documents written by colonial administrators and some scientists (Pellegrin, 1914; Monod, 1928). There is some indication that the fish trade started to expand at this time, reaching a maximum of 10,000 tonnes per year (late 1950s), for a number of good reasons. First, during the colonial period, the LCB and other parts of Africa, were incorporated into the global capitalist economy (Shenton & Freund, 1978), and trade in many agricultural commodities was encouraged by colonial policy (for the benefit of Britain and France). Second, this policy was facilitated through an improvement in transport infrastructure (road and rail), and greater security for merchants and their goods. Third, the growth of urban markets for food, particularly in Nigeria,

provided a further incentive for the fish trade. It should be noted, however, that the impact of colonialisation on rural communities in the LCB had both positive and negative aspects. In particular, although security was improved overall, there is also evidence that the ability to cope with environmental variability had been reduced through the change in social relations brought about through the commoditization of production. This change contributed to a series of famines in the region during the colonial period.

Box 7: The Fish Trade in the Lake Chad Basin: 4 Stages

1800 – 1900 Pre-Colonial Period (1,000 tonnes/year, wet weight): small fish trade during the pre-capitalist period; fisheries mainly part of the subsistence economy; farming and fishing to secure livelihoods and food security;

1900 – 1960 Colonial Period (up to 10,000 tonnes/year): fish trade increased with growth of colonial economy, where commodity trade of surplus production was encouraged; increased demand for fish from urban areas, new roads and security for merchants facilitated this trade;

1960 – 1990 Post-Colonial Period (10 – 175,000 tonnes/yr): following independence all LCB countries implemented new economic policies; fisheries policy emphasized production increases; fishing effort, catches and trade increased; severe drought reduced Lake Chad and catch and trade increased temporarily as fish stocks were concentrated; catch and trade then declined and stabilised (c.100KT/yr); high demand for fish from urban south Nigeria;

1990 – 2004 Contemporary Period (60-120,000 tonnes/yr): environmental conditions have improved, fish catches and trade have increased; demand for fish remains high, urban Nigeria is the main market; policy for fish trade and livelihoods constrained by a regular flow of information and institutional capacity;

Post-Colonial Period (1960-1990)

All of the LCB riparian states gained independence around 1960, and the rural producers involved in agriculture and fisheries became citizens within the market economies of their new countries. The new governments also developed and implemented new economic policies, to varying degrees, but with a general emphasis on modernisation and expansion. Fisheries policies encouraged fisheries development through increased catches and improved utilisation. In the LCB, new fishing gears and motorisation, coupled with improved road transport (particularly in Nigeria), and greater access to urban markets, encouraged the expansion of the LCB fish trade (Mann, 1962). During this period, the average annual LCB fish trade was an estimated 100,000 tonnes (wet weight) per year, and reached over 175,000 tonnes (wet weight) in 1974, coinciding with a major Sahel Drought, and shrinkage of Lake Chad (fish were concentrated and easy to catch) (Stauch, 1977; Durand, 1983). The fisheries and fish trade were also associated with the emergence of specialist fish traders who coordinated and managed the long-distance trade. Most of the traders appear to have been locals, and were also involved in other trade in farm produce (crops and cattle) and minerals (salt) from the LCB, although detailed information is not available.

The Post-Colonial Period also saw the emergence of a greater flow of information on the LCB fisheries, as government policy-makers and

international development agencies sought a better understanding of policy priorities. However, despite the establishment of the Lake Chad Basin Commission (LCBC or CBLT) with a mandate to coordinate the LCB policy process, the overall situation was characterised by fragmentary (often nationally-focused) policy development and implementation in all sectors, and a general lack of adequate information to support policy decision-making and prioritization (Neiland and Bene, 2002). All five LCB riparian countries have experienced major difficulties in establishing a sound political and economic system to underpin and enable appropriate institutions, policies and processes for sustainable development (characteristics of the 'weak state').

In the case of the LCB fish trade, which appeared, ironically, to thrive during this period, there was no systematic monitoring or investigation by the LCB national governments or CBLT. However, a number of dedicated studies and research projects, sometimes linked to policy initiatives on fisheries development funded by bi-lateral or multi-lateral agencies, represented an invaluable source of information and understanding. These activities have also helped to highlight the possibilities for designing information systems to support policy processes in the future. Five main groups of studies can be identified as follows below.

First, Stauch (1957, 1959) in Cameroon surveyed the fish markets and trade in north Cameroon. He noted that the trade was highly commercialised, and probably needed to be regulated to control the activities of the monopolies of merchants (which were considered to prevent free trade). Stauch (1960a/b) also investigated the trade in dried fish (*salanga*) between Cameroon and Nigeria, which was estimated to be 10,000 tonnes per year. He described the traditional organisation of the trade, and the positive impact of new road infrastructure in Nigeria on the commercial trade. Stauch (1961) also examined the possibilities for 'taxing' the fish trade. From 1969-76 Stauch (1977), working with ORSTOM and the Federal Dept Fisheries in Nigeria (see Hopson, 1967), organised an innovative fish trade monitoring system. By counting the numbers and types of vehicles transporting sacks and cartons of fish along the main roads (mainly from Baga to sourthern Nigerian markets), it was possible to estimate the fish trade and fish landings in and around Lake Chad. The system worked well, and it was estimated that the annual trade in fish was about 100,000 tonnes (wet weight). There is no estimate for the LCB as a whole., although the trade around Lake Chad probably constituted the majority of this.

Second, scientists from ORSTOM based in N'djamena also undertook surveys and investigations of the fish markets and trade in Cameroon (Couty, 1964) and Chad (Couty and Durand, 1968), followed by a wider investigation of the LCB (Couty, 1968). The studies revealed the complexity of the trading systems, including the social relations between merchants and producers.

Third, a research programme into the ecology of the LCB, based in N'djamena, and undertaken by ORSTOM (1965-78) included fisheries, and Durand (1983) provides a good overview of the development and characteristics of the fisheries, including the fish trade and incorporating the earlier work by Stauch, Couty and Duran (above). The ORSTOM programme was halted in the early 1980s due to the civil war in Chad. The studies helped to reveal the impact of climatic change and hydrological dynamics on the fish market and trade.

Fourth, a UNDP/FAO project 'Improving Fish Processing and Transportation on Lake Chad' operated between 1980-85 based in Baga, Nigeria (FAO, 1982). Although the main objective was to promote a range of technical interventions to reduce post-harvest losses (e.g. ice-making, new smoking ovens), the project also undertook a series of investigations into the fish markets and fish trade (mainly using external experts). Interestingly, while this project diagnosed many constraints to the fish trade (post-harvest losses, transportation across the lake, lack of fisher organisations), it appears that none of the interventions proposed and attempted had any impact (the same constraints continue to operate today).

Fifth, in Nigeria, the Lake Chad Basin Research Institute (LCBRI) was founded in the early 1980s. Fisheries is one of component programmes and both Azeza (1982) and Sagua (1986) (amongst others) examined the fish trade and its future development possibilities. Sagua (1986) provides an overview of the evolution of the fish trade and the range of factors which have affected it, including drought. Azeza (1982) examined technical solutions to reducing post-harvest losses due to insect infestation. The LCBRI tended to undertake specialised studies in fisheries, and did not monitor the LCB fish trade or maintain detailed statistics.

Contemporary period (1990 – present day):

Since 1990, the LCB has been characterised by a general improvement in environmental conditions with higher rates of riverine discharge and a gradual enlargement of Lake Chad. In 2004, Lake Chad and its fringing floodplain covered over 10,000 sq.km, compared to 6,000 sq.km in 1985 (Neiland and Bene, 2002). The political situation has also stabilised in the five riparian countries (except CAR), although all continue to show low levels of economic growth and development. In general, the impact of national policies in all sectors within the LCB should be greater, and the region remains remote and underdeveloped, with a high level of poverty (although accurate and comprehensive statistics are not available). The volume of fish traded during this period is estimated to be 60-120,000 tonnes (wet weight) per year.

During this period, a series of research and development projects were initiated within the fisheries sector. The general focus was now on the socio-economics, policy, management and poverty aspects of fisheries, both to extend and complement the work which had gone before (above), which tended to focus on the biological and environmental aspects, with some socio-economics as an add-on to projects. Three projects, which in particular, have considered the fish trade and markets are highlighted below.

First, in Nigeria (1993-1997), the DFID-funded 'Traditional Management of Artisanal Fisheries (TMAF) Project' (Neiland, 1997) undertook a wide-ranging investigation of artisanal fisheries, including the western shore of Lake Chad. This included general multi-disciplinary surveys to characterise the fisheries, followed by more detailed surveys to investigate socio-economic profiles, the extent and nature of poverty, and the operation of fisheries management systems (Neiland et al. 2005). A key activity was the design and operation of a fisheries information monitoring system (FIMS), and to test its utility for fisheries policy-makers. The FIMS operated at Lake Chad drew upon the earlier experience of Stauch (1957-77), and included both a road-side monitoring of

the fish trade, surveys of local markets and interviews of key fisheries stakeholders to build up a picture of the fisheries, the markets, and the fish trade. Overall, the FIMS component of the TMAF project generated important research findings regarding the design of an information system to support the policy process. In addition, the FIMS helped to further characterise the LC fisheries and fish trade in Nigeria, and to highlight the importance of the fisheries and trade in this part of Africa.

Second, the work initiated by the TMAF Project (above) was used to underpin a new EU-INCO project 'Sustainable Development of African Continental Fisheries' (1998-2002) (Neiland and Bene, 2002), which included sections of the LCB in Nigeria, Cameroon and Chad. The methodology for FIMS (plus complementary socio-economic analyses) developed by TMAF was further refined and field-tested involving the cooperation of stakeholders and project staff in all three LCB countries (mainly around Lake Chad). The resultant research findings including detailed descriptions of the fish trade, stakeholder relations, socio-economic and livelihoods analysis, and poverty profiling were synthesised within a policy analysis framework. Overall, it was concluded that the fisheries were a - key component of livelihoods, trade (60K t/ $20 million per year around Lake Chad and associated wetlands) was central to the operation of the fisheries, but that fisheries policy was weak and needed to be further elaborated. This would require better and more regular flows of information, and also the development of capacity within regional and national institutions for appropriate policy design and implementation.

Third, the work of the EU-INCO Project (above) was further developed and extended to all of the countries of the LCB with a new SFLP-funded project entitled 'Study of the Contribution of Fish Marketing to Livelihoods in the Countries of the Lake Chad Basin: Cameroon, Chad, Central African Republic, Niger and Nigeria (2002-2004)' (Neiland and Bene, 2004). The main objective was to contribute to a better understanding of the role of fish marketing in livelihoods and to make this new knowledge available to national policy-makers. The study was undertaken by teams from each LCB country and facilitated by the SFLP, the Lake Chad Basin Commission and experts from IDDRA (UK) and the WorldFish Center (Egypt). The study methodology included setting-up a basin-wide FIMS to monitor the fish trade, stakeholder analysis and policy analysis, and is outlined in the next section (below).

4. METHODOLOGY FOR CHARACTERISING LCB FISH MARKETS AND TRADE

4.1. Overview

The SFLP-funded project entitled 'Study of the Contribution of Fish Marketing to Livelihoods in the Countries of the Lake Chad Basin: Cameroon, Chad, Central African Republic, Niger and Nigeria (2002-2004)' (Neiland and Bene, 2004), which built upon earlier research (described above), used a pragmatic and evidence-based methodology for characterising LCB fish markets and trade. The methodology which is outlined in this report (below) represents a revised (and improved) version of the original approach in light of the overall experience of the project work.

Overall, the characterisation of fish markets and trade in the LCB focuses on providing relevant information in three main categories and a total of 10 sub-categories, as shown in Box 8 below:

Box 8: Characterisation of Fish Markets and Trade: 10 information types

Basic trade statistics:

1. Geography of trade (market locations and trade routes);
2. Fish product types;
3. Fish product volumes;
4. Fish product values;

Stakeholder relations and trade organisations:

5. Key stakeholders and livelihoods;
6. Relations between key stakeholders;
7. Market organisation and price formation;

Policy analysis and future priorities:

8. Policy analysis - national;
9. Policy analysis – basin-wide;
10. Future policy and priorities;

The first category – *basic trade statistics* – provides a summary of the geography of the trade, location of main markets and trade routes, followed by a description of the main traded products, and the total volume and value of the products traded.

The second category – *stakeholder relations and trade organisation* – identifies and describes the main stakeholders, their livelihoods, and the inter-relationships between them, and how this relates to the operation of the market and the organisation of the trade, and the distribution of benefits;

The third category – *policy analysis and future priorities* – considers the wider context of the fish market and trade (economic, social, political aspects), the nature of change and development in the region, the performance of policy and the reasons for the level achieved at both national and regional (basin-wide levels), the likely future opportunities and threats, and identifies future policy priorities.

4.2. Specific methodology

The information required to complete the characterisation of the fish trade and markets can be generated by four inter-related and complementary work-packages (WP1-4) as shown in Box 9 below.

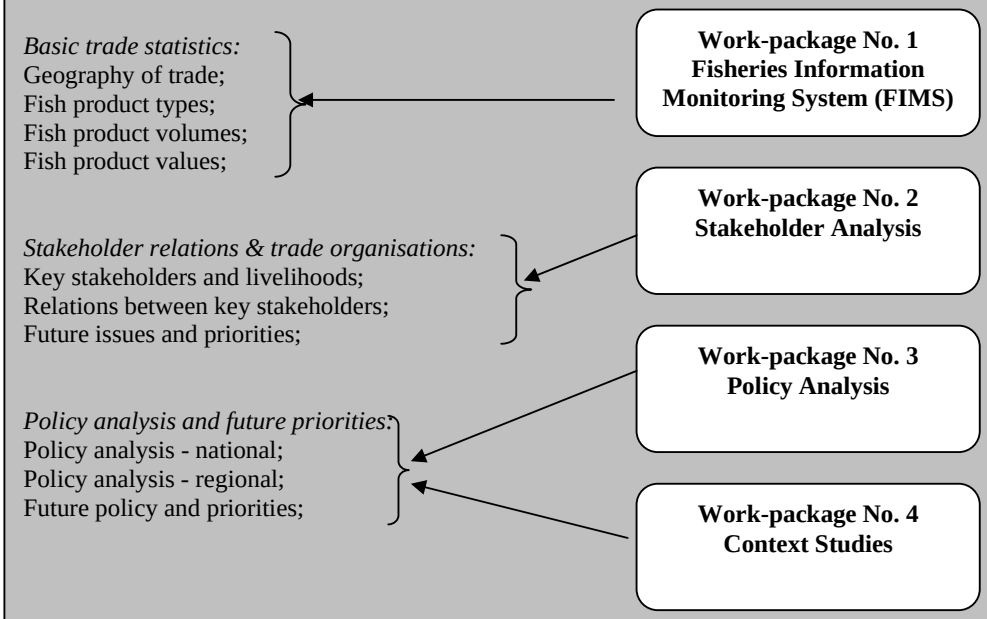
4.2.1. WP1: Fisheries Information Monitoring System (FIMS) (Months 1-12)

The objective of FIMS is to generate basic fish trade statistics over 12 months, including the geography of the fish trade, products, volume and value. A manual for the establishment of a basic FIMS for the LCB was produced by

Neiland *et al.* (2002) as part of the SFLP-funded project. This manual identified 12 steps for the design and implementation of the FIMS, as shown in Box 10 below.

Step 1 (Initial preparation) - prepares the groundwork for designing and implementing a FIMS, and requires the national experts responsible to consult background documents on fisheries monitoring in general, and to learn from

Box 9: Characterisation of Fish Markets/Trade: 4 Work-packages



past experiences both nationally, within Africa and internationally. In addition, it is essential to undertake an institutional audit in order to scope out the likely opportunity and threats to FIMS development, including an assessment of capacity needs and cost.

Step 2 (Specification of Information Needs) – four basic types of information will be collected for each type of fish or fish product within the fish trade over 12 months as follows: Volume of fish (or fish product); Value of the fish (based on first sale prices); Origin of the fish; Destination of the fish. A simple data collection form is provided in the FIMS Manual (Neiland *et al*. 2002). There are three good reasons for choosing to collect these four basic statistics: the information is pertinent (it can be used to provide a good overview of the fish trade); the information is relatively easy to collect (using trained enumerators); and the information can be processed quickly and standardised for a global analysis.

Step 3 (Specification of Monitoring Locations) – the selection of monitoring locations for FIMS in each country must be undertaken carefully using the following criteria: Is the location representative for the sale and trade of fish?

(e.g. an important market?); Are the fish sales, markets and trade routes well-organised, and can this activity be monitored easily by a small team of enumerators? Is the location accessible at all times of year? To answer these questions requires careful background research of the location and trade activities, and it helps to use planning aids (e.g. sketch-maps) and to seek local advice before making a final decision.

Step 4 (Designing a Monitoring Schedule) – given specific constraints of funding and man-power, the FIMS will only be able to operate for a certain number of days each month (a sample), and the information will need to be scaled-up to produce monthly totals. The design of the monitoring schedule will need to balance three issues: (i) pertinence of information; (ii) statistical

Box 10: Work-package 1: Fisheries Information Monitoring System (FIMS) – 12 steps

1. Initial preparation;
2. Specification of information needs;
3. Specification of monitoring locations;
4. Designing a monitoring schedule;
5. Using the data collection forms;
6. Selection and training of enumerators;
7. Data analysis;
8. Reporting;
9. Quality control;
10. Protocol;
11. Technical support;
12. Design piloting, budgeting and re-iterations;

Source: Neiland *et al*. 2002

accuracy; and (iii) cost of information. The monitoring schedule should specify (in a table), the locations, dates of monitoring and the scaling–up method for each month (1-12).

Step 5 (Using the Data Collection Forms) - each FIMS data form has a series of boxes in columns which must be completed by the enumerators stationed within the chosen fish market or road-side monitoring location. In the first instance, all enumerators must become familiar with the form. The data to be recorded includes: Name of enumerator; Name of market; Date of survey; Type of fish commodity; Total volume sold; Total sale value and unit price; Origin of fish; and Name of export destination. The forms also have space to collection additional *ad hoc* information (e.g. from stakeholders).

Step 6 (Selection and Training of Enumerators) – on the basis of a job application form, select 5-10 candidates (depending on the enumeration task and key qualifications such as languages spoken and experience). The candidates should then complete a 3-day training course (data collection methodology and interview approaches). On the basis of an end-of-course assessment test, select and employ the best candidates. Training and checking of

the work of the enumerators will continue during the survey process, as required.

Step 7 (Data Analysis) – the primary data recorded in the Data Collection Forms needs to be analysed each month to provide a basis for monthly FIMS reports. Using basis arithmetric skills (or a computer if available), four Summary Tables will be completed: (1) Fish Trade Composition (quantity/value/month); (2) Origin of Fish (quantity/value/month); (3) Destination for Fish (quantity/value/month); (4) Fisheries Production Estimate (quantity/value/month). The data analysis and completion of these Summary Tables can be time-consuming, and appropriate resources need to be budgeted. The process also requires attention to detail, care and re-checking of calculations, as a matter of good practice.

Step 8 (Reporting) – the FIMS system should yield a brief report of the results of the monitoring system at the end of every month (or 12 monthly reports after 1 year of operation). The basis of the FIMS Monthly Reports are the FIMS Summary Tables (Step 7 above), and represent a summary of the main findings. The structure of the report is standardised as follows: Title page (Title, country, authors, dates); Sections: (1) Fish market and trade characteristics; (2) Fish production estimate; (3) Contextual information; (4) Comments on FIMS operation; (5) Appendices.

Step 9 (Quality Control) – the collection, analysis and subsequent reporting of the data and information collected by FIMS requires great care if it is to be successful in generating useful advice for fishery managers and policy-makers. It is important that FIMS managers do their up-most to anticipate, detect and minimise the impact of possible inaccuracies, biases and flaws in the process overall. Quality control points should be installed at all stages, and include both routine and random checks. Corrective measures should then be taken to address the problems detected. The possibility of using incentives to promote accuracy amongst the FIMS team should be considered.

Step 10 (Protocol) – the success of the FIMS in the LCB countries will depend to some degree on the manner in which the system is introduced and explained to all stakeholders in the fisheries, particularly those whom it may affect directly. There is no doubt that they will want and need to understand the objectives and implications of the FIMS. This will almost certainly involve visits and meetings with the different stakeholder groups, and discussion to reach agreement over the operation of the FIMS and their participation, and eventual access to and use of the information generated. The FIMS team in each country will need to think carefully about local issues of protocol, and act accordingly.

Step 11 (Technical Support) – the LCB country teams involved in the design and implementation of FIMS were supported by experienced scientific technical advisers from the UK and Egypt. The support was available in four forms: Questions/Answers by e-mail as appropriate; Provision of key papers and technical papers; Review/Comments on country-specific FIMS design and monthly reports; and Technical Seminars.

Step 12 (Design Piloting, Budgeting and Re-Iterations) – the design, implementation and sustainable operation of a FIMS in the long-term is a major

challenge in the LCB or any other African inland fisheries system. It is important to plan each stage carefully, to consider the option of an initial small-scale pilot, and to be prepared to go through various iterations of design based on lesson-learning in order to establish a workable system. The trade-offs between information pertinence, statistical accuracy and budget are key concerns.

4.2.2. WP2: Stakeholder Analysis (months 3-9, out of 12)

The objective of the second work-package is to contribute to a better understanding of the different stakeholders involved in fish markets and trade. For the SFLP-funded study, this was undertaken in a series of five steps as summarized in Box 11 below, and explained below:

Step 1 (Study Preparation) – an initial investigation and assessment of status of knowledge on LCB fish market and trade stakeholders was undertaken (see Section 3 above). It was judged that there was relatively little known about the different groups and their inter-relationships. A wider examination of the literature showed the range of methodology which had been used in 'stakeholder analysis' in general. Each national study team scoped out the options for stakeholder analysis within the context of their own particular fisheries. The results of this preparatory work were discussed at a workshop involving all of the study team, and used to produce a study design (next step).

Box 11. Work-package 2: Stakeholder Analysis – 5 key steps

1. Study preparation: assessment of status of knowledge of stakeholder groups; scoping of stakeholder analysis options through international literature; comparison with local context and conditions; workshop to discuss and finalise methodology, and coordinate between LCB countries;

2. Study design: using results of Step 1; focus on identification of key stakeholders (primary, secondary, tertiary); use of semi-structured questionnaires (via interviews); collect information on livelihoods, inter-relationships between stakeholders; opinions on status and future prospects; leading to a concise report;

3. Training: to ensure each study team could use the methodology (Step 2); use of local knowledge and protocol to assist process; use of 'role-play' in a workshop to practice; awareness and problem-solving during implementation;

4. Study Implementation: over 6 months (month no.3-9 out of 12) in each LCB country; no. interviewees depended on national context and factors affecting implementation (distances, market distribution etc); study teams must justify scope/limitations of study;

5. Analysis and Reporting: synthesis of interviewees; distil and analyse key issues to provide a better understanding of fish market/trade stakeholders, relations and future prospects for livelihoods; produce a concise national report; discussion at project workshop; inter-national comparison with LCB;

Step 2 (Study Design) – using the preparatory information, the study design focused on the identification of key stakeholder groups (primary, secondary and tertiary) within the LCB fish markets and trade, and the use of semi-structured questionnaires (administered through interviews) to collect information on the livelihood characteristics of each stakeholder group (in relation to the fish markets and trade), their inter-relationships and their opinions on the status and future prospects for livelihoods in this sector. The information collected would be analysed and synthesised into a concise report.

Step 3 (Training) – this step focused on ensuring that each study team understood how to identify key stakeholder groups, how to administer the semi-structured questionnaires and how to analyse and report the study results. Particular attention was given to using local knowledge to select representatives of each stakeholder group for interview, the protocol of the interview process, and the advantages and opportunities provided by a semi-structured interview process (to focus in on key issues). Interview technique was perfected using 'role-play' in the study team workshop.

Step 4 (Study Implementation) – this work-package was implemented simultaneously over 6 months in all five LCB riparian countries. The number of interviewees and locations depended on the national context. For example, in Nigeria, the profile of the study is shown in Box 12 (below).

Step 5 (Analysis and Reporting) – the interview information was analysed and produced as a brief report. The findings were compared and discussed at a final workshop of the project involving all the LCB national study teams, and used as contribute to the final synthesis report of the project overall.

Box 12. Profile of fish market and trade stakeholder analysis study in LCB (Nigeria), 2002-2004

Key Typology	Stakeholder groups	No. persons interviewed	Major themes (aide memoire)
Primary stakeholders	Fishers Fish processors Fish sellers Fish buyers	4 4 4 1	- nature of work; - relations with others; - livelihood status; - livelihood changes; - prospects
Secondary stakeholders	Transporters Ancillary actors Retailers Consumers	2 2 4 4	
Tertiary stakeholders	Fisheries Depts - Federal - State - Local Planning/Rural Depts Micro-finance institutions	 2 1 1 1 3	- position in organization; - relations to fish trade; - nature of relations; - future prospects

Source: Ladu, Ovie and Sule (2004)

4.2.3. WP3: Policy Analysis (Months 6-12, out of 12 months)

The objective of the third work-package is to consider the policy context, to investigate the performance of specific policies, to examine relevant policy issues and to identify future policy priorities. Within the SFLP-funded study, this was undertaken in four steps as summarized in Box 13, and explained below:

Step 1: (Training in Policy Analysis) – to initiate this WP, a short-course in policy analysis was organised for study teams covering a wide range of topics including: policy definitions; reading and understanding policy documents; relations to governance and government; non-sectoral and sectoral policy; the policy process concept; importance of narratives and information systems; policy-makers and policy actors; policy profiling; assessment of policy performance; evaluating policy performance; influencing policy change; and policy priorisation methods. This was supported with a package of reading materials from the international literature, worked examples and case-studies. A standard approach to policy analysis was adopted as a methodology for this work-package (Steps 2-4 below).

Box 13: Work-package 3: Policy analysis – 4 steps

1. Training in policy analysis: short-course in policy analysis covering concepts and methodology; supported with reading materials, worked examples and case-studies; adoption of a 'standard methodology' for all LCB national study teams;

2. Policy profiling: exercise to identify national policy in each country focusing on economic development; development policy, agriculture and fisheries policy; key questions: what are objectives of policy? Mandated organizations for policy implementation? Policy context?

3. Policy analysis and reporting: assessment and evaluation of policy performance: have policy objectives been achieved? To what level? How can policy performance be explained?

4. Future policy development: workshop to consider results of policy analysis; identify and compare key issues between LCB countries; policy SWOT analysis to prioritise issues; recommendations for future policy development; summary report.

Step 2: (Policy Profile) – the study teams undertook a brief exercise to identify national policy in each country focusing on economic policy, development policy and agriculture and fisheries policy. A series of key questions were posed: What are the objectives of policy? What are the mandates related to and derived from this policy? Which organisations or institutions are responsible for policy design and implementation? What is the policy context?

Step 3: (Policy Analysis and Reporting) – using the Policy Profile information as a starting point, but also using additional information as appropriate, an

assessment and evaluation of policy performance was undertaken. Policy assessment addressed three questions: Have the stated objectives of policy been achieved? To what extent have they been achieved? What sources of information underpin this assessment? Policy evaluation addressed four questions: How can the level of policy performance be explained? What influence have political interests had on performance? How has policy been influenced by actor-networks? How have policy approaches been shaped by particular development narratives? Each national study team in the LCB produced a report on 'policy analysis and LCB fisheries' to summarise the key findings of their work.

Step 4: (Future Policy Development) – a workshop was organised with four objectives and activities: (a) national study team presented their policy analysis findings, and discussed the findings with the other teams (b) the key policy issues affecting fisheries and the fish markets and trade across the LCB were identified; (c) a policy SWOT analysis was undertaken to help prioritise the issues which had been identified; and (d) a set of recommendations for future policy development were produced. The LCB policy analysis findings were produced in a summary report.

4.2.4. Contextual Studies (Months 1-12)

The fourth work-package was less well-defined that the other three (above), but still merits consideration. The national study teams were encouraged to develop bibliographies of publications (research papers, government reports, international publications etc) relevant to the investigation and analysis of the fisheries, fish markets and trade, and to share this information with colleagues from the other riparian states. The objectives were to provide as wide a base of knowledge for analysis of issues, and to encourage a greater understanding between countries. Study teams were encouraged to make copies of key publications available to other teams, and where possible electronic versions were stored on a project web-site (www.onefish.org).

Box 14: Work-package 4: Contextual studies relevant to fish markets, trade and policy

(i) National bibliographies of key publications prepared by each LCB national study team;

(ii) Key documents from international literature, highlighting new concepts, ideas, methodologies and the results of other relevant studies from other parts of the world collected by international counter-parts;

(iii) Exchange of literature encouraged by project to provide as wide a knowledge base for analysis and understanding of the LCB fish markets and trade.

4.3. Importance of effective study management

The four work-packages outlined above are based on the methodology operated over 12 months in five LCB riparian countries as part of the SFLP-funded

study. The study was completed successfully and has generated new and interesting results, which will be explained below, giving an overview of the fish market and trade in the LCB. However, it is important to point out that the success of the study was built upon a high level of well-established collaboration between the project partners (from past projects), and a good capacity for management and coordination of the work by experienced scientists and field staff. In the future, other teams elsewhere may also wish to use the LCB study methodology, and attention would need to be given to the question of how a new study (operating in a new context) would be managed in order to produce an effective outcome.

5. CHARACTERISTIZATION OF THE LCB FISH MARKET AND TRADE 2002-2004: KEY FINDINGS

5.1. Introduction

In this section, the characteristics of the Lake Chad Basin fish market and fish trade for 2002-2004 will be presented based on the empirical research findings of the SFLP-funded study, and using the framework presented earlier in Box 9 (above)

5.2. Basic trade statistics

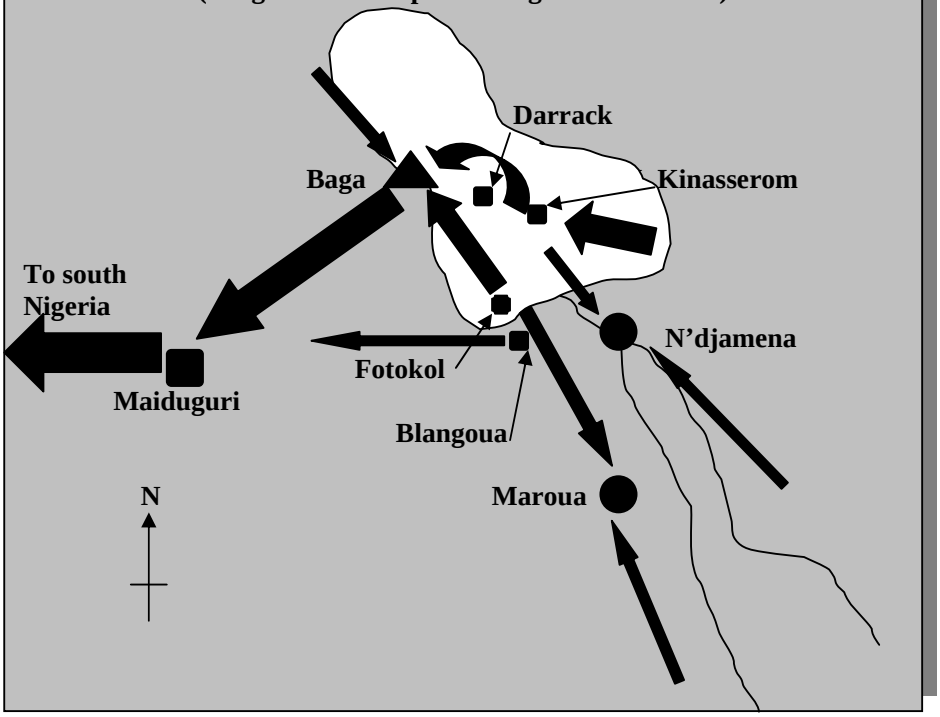
5.2.1. Geography of the fish markets and trade

There are two main components to the fish trade in LCB. First, a local trade within each country, with fishers and local merchants supplying both fresh and some processed fish to local markets within villages and towns. This trade occurs in close proximity to fishing grounds, and does not involve long-distance or cross-border transportation of fish. Second, a long-distance trade, with processed fish products (and a limited quantity of fresh fish) transported mainly by specialised merchants and using large trucks to urban markets far from the fishing grounds, and often crossing borders.

The local trade in fish which occurs in each of the LCB countries is a long-established part of the rural economy, and was documented by early observers (see Section 3. above). The long-distance and cross-border trade is a more recent development, which has emerged in the past 50 years with the growth of urban markets, better infrastructure and through the entrepreneurial activity of merchants. Based on the findings of the current study a map of the LCB fish markets and trade is shown in Box 15.

In Cameroon, there is an active local trade in fish (fresh and processed) close to the major fishing areas of the rivers Chari and Logone (and floodplains), and Lake Chad. There is also some trade in fish to the larger urban centres of Maroua, Garoua and Kousserri (using main roads). However, the major trade involves processed fish exports (mostly informal) from the markets of Fotokol and Blangoua to the major market at Baga on the western shore of Lake Chad in Nigeria (a distance of 200 km by boat and un-tarred roads) and to Maiduguri (2000 km by tarred roads from the Cameroon border).

Box 15: Sketch map of fish markets & trade routes in the Lake Chad Basin, centred on Lake Chad (2002-2003)
(Larger arrows represent high trade volume)



In the Central African Republic, where road infrastructure is limited, the majority of the fish trade tends to be local. There is some trade in fish to the urban centre of Bangui. There is a limited international trade (informal) in processed fish to Chad (Sarh and Moundou) and even a small trade to Cameroon and Nigeria which was developed over the past 10 years by (mainly) Nigerian merchants.

In Chad, there is a local trade in fish associated with the main fishing areas around Lake Chad and the River Chari and its floodplains. There is also a trade in fresh and processed fish between Lake Chad and the capital city of N'djamena, using a tarred road for transport. However, the major trade is across Lake Chad, where fish caught in Chadian waters is transported and sold (both fresh and processed) to the island markets of Kinasserom and Darrack, and onto to the large lake-shore market at Baga in Nigeria. The exact size of this trans-lake trade is very difficult to gauge given the vast and uncharted nature of this part of Lake Chad. The trade is both international and mainly informal (does not appear in national statistics or is not subject to formal cross-border regulations to any significant degree).

In Niger, the main fishing grounds lie in Lake Chad (which has recently re-flooded this section of its northern basin). A small local trade in fish exists along the lakeshore villages, but the major trade is cross-border to Baga in Nigeria. Once again, a large proportion of this 'international' trade is informal.

Finally, in Nigeria, there is an active local fish trade with villages and small towns, both along the western shore of Lake Chad, and also along the main course and associated floodplain of the major influent river in this part of the LCB, the Yobe. However, by far the largest market, and centre of all the LCB fish trade associated with Lake Chad in particular, is at Baga. From here, processed fish is transported by trucks on a daily basis by tarred road to Maiduguri (250 km), and then mostly onto the southern urban markets of Onitsha (1000 km), Enugu (1000 km), Lagos (1500 km) and Ibadan (1400 km).

5.2.2. Fish product types

In general, the fisheries of the Lake Chad Basin can be divided into three basic types: lake, river and floodplain (or swampland). The main fish species landed in each fishery are also distinctive and related to the seasonal environmental conditions (further details are provided in the national study reports, appendix 1). The local fish markets and trade in each country reflect the types of fisheries with which they are associated, usually trading in a wide variety of fresh fish on a daily basis with some variation by season.

The long-distance fish trade in each country, and also the cross-border trade, have developed particular processed fish products. In each LCB country fish of particular types are often sun-dried or smoked, sorted by size or type of product, and then packaged in sacks or boxes (or cartons) of a specific design, size and shape for transportation. The exact characteristics of the process tend to vary by country (details can be found in the national study reports, Appendix 1).

5.2.3. Fish product volumes

The total volume of fish traded in the LCB and recorded by the FIMS for the 12-month period (Sept 2002 – September 2003) was 119,034 tonnes, as shown in Box 16 below.

Box 16. Overview of the fish trade in the Lake Chad Basin measured by FIMS, 2002-2003 (12 months)

	Volume of fish traded (tonnes, wet weight) [(1)]	Value of fish traded (US$000's)	Main markets
Cameroon	24,800	8,000 (15%)	Local, urban, Nigeria
CAR	530	254 (<1%)	Local, urban, Chad
Chad[(2)]	10,873	6,400 (10%)	Local, urban, Nigeria
Niger	37,840	14,800 (27%)	Local, Nigeria
Nigeria	45,864	26,000 (48%)	Local, urban south Nigeria
Total	119,034	53,854 (100%)	

Source: modified from Neiland and Bene (eds) (2004)
Notes: [(1)] Measured dry weight converted to wet weight (x 4 conversion factor; no auto-consumption); [(2)] Chad enumeration measured for 9 months, extrapolated to 12 months;

Nigeria recorded the largest volume of trade in LCB fish at 45,864 tonnes (wet weight), followed by Niger (37,840 tonnes) and Cameroon (24,800 tonnes). The total trade volume was lower in Chad (10, 873 tonnes) and CAR (530 tonnes).

For Nigeria, Niger and Cameroon, while some of the LCB fish is sold locally, the majority of the traded fish is destined for urban markets, and mainly in the south of Nigeria (Box 17). The most important urban markets are Onitsha, Enugu, Lagos and Ibadan, which together account for 69% total volume (31,647 tonnes) of LCB fish traded within Nigeria. The major market in Chad is the capital city of N'djamena, and in the CAR, the fish trade is mainly to local markets.

Box 17. Markets for LCB fish trade in Nigeria (2002-2003)

Market	Volume (tonnes, wet wt)	Value (US$ 000s)
South Nigeria		
Enugu	9,173 (20%)	5,980 (23%)
Onitsha	11,466 (25%)	7,020 (27%)
Lagos	5,504 (12%)	2,860 (11%)
Ibadan	5,504(12%)	3,120 (12%)
Illorin	2,752 (6%)	1,560 (6%)
Benin	5,504 (12%)	2,860 (11%)
Ondo	1,376 (3%)	780 (3%)
Sub-total	41,278 (90%)	24,180 (93%)
North/Central Nigeria		
Kano	1,376 (3%)	520 (2%)
Maiduguri	917 (2%)	260 (1%)
Jos	1,835 (4%)	1,040 (4%)
Sub-total	4,586 (10%)	1,820 (7%)
Total	**45,864 (100%)**	**26,000**

Source: Ladu, Ovie and Sule (2004)
Note: Total traded fish volume (dry wt.) = 11,466 x 4 (conversion factor) = 45,864 (wet wt.)

5.2.4. Fish product values

The total value (first sale) of fish traded in the LCB and recorded by the FIMS for the 12-month period (Sept 2002 – Sept 2003) was US$ 54 million, as shown in Box 16 above.

Nigeria recorded the largest value for LCB fish traded at US$ 26 million, followed by Niger (US$ 15 million) and Cameroon (US$ 8 million). The total value of the trade recorded was lowest in Chad (US$ 5 million) and CAR (US$ 0.25 million).

The urban markets of Nigeria are the major markets for LCB processed fish. As shown in Box 17, Enugu, Onitsha, Lagos and Ibadan account for 73% (US$20 million) of the total value of the traded LCB fish. There is no doubt that this fish originates from all the LCB countries (there is even some trade from CAR), but at present, it is difficult to define the exact origin or the routes (i.e. the trade is largely informal, and does not appear in official statistics).

5.2.5. Assessing the implementation and performance of FIMS

During the 12-month period from September 2002 to September 2003, an attempt was made, for the first time, to implement the Fisheries Information Monitoring System (FIMS) in all five riparian countries of the Lake Chad Basin, to monitor the commercial fish trade. Except for the CAR, all the LCB countries focused on the trade around Lake Chad (the major fishery). In March 2004, the five study teams and the external project participants met to review the implementation and performance of FIMS, and to assess the impact on the fisheries trade statistics which had emerged. The results by country are shown in Box 18. Overall, the FIMS (2002-2003) performed well in Cameroon, Niger and Nigeria, and less well in CAR and Chad. It is estimated that the FIMS recorded 80% of the volume (tonnes) of LCB traded fish. The national totals for CAR and Chad were underestimated, and also the local trade in all countries. The improved volume estimate of LCB traded fish (2002-2003) is 156,109 tonnes (wet weight).

Box 18: Implementation and performance of FIMS: a preliminary assessment

	Assessment Score (out of 10)	**Justification**	**New trade estimate, tonnes wet wt (+/- %)**
Cameroon	8	(+) past experience; good planning; well-defined trade routes; (-) local trade too scattered to monitor, especially along river Logone;	29,760 (+20%)
CAR	3	(+) dedication of staff to project; (-) limited past experience; interrupted by civil conflict; remote and inaccessible fisheries;	2,120 (+400%)
Chad	3	(+) past experience of research; (-) institutional changes hindered implementation; remote and inaccessible fisheries;	20,000 (+200%)
Niger	7	(+) past experience of research; good planning; relatively smaller geographical area; (-) some trade routes still new and unknown;	49,192 (+30%)
Nigeria	8	(+) past experience; good planning; well-defined trade routes; (-) some local routes too scattered to monitor; Yobe River wetlands not covered;	55,037 (+20%)
Average	**6**	**Total**	**156,109 (+31%)**

5.3. Stakeholder relations and trade organisation

5.3.1. Key stakeholders, livelihoods and the fish trade

In each of the five riparian countries, the study teams did not experience any difficulty in identifying the key stakeholders in the three categories – primary, secondary and tertiary stakeholders. The subsequent interviewees revealed some

interesting similarities and differences, in terms of activities and livelihoods, between the countries.

In general, the results of the interviews indicated that the fish trade provided an important source of livelihood for both primary stakeholders (fishers, processors, merchants) and the secondary stakeholders (transporters, ancillary workers, retailers and consumers). Many of these people and their families had been involved or connected with the fish trade for a long time, and had built up a sound livelihood base. It appeared that knowledge and know-how of the fish trade were important assets for successful participation in the fish trade (as with any other specialised activity). The results also indicated that the primary stakeholders had to cope with a fluctuating supply of fish – mainly due to the dynamics of the LCB aquatic environment. The ability to cope with risk and uncertainty was an essential part of their strategy for ensuring a sustainable livelihood. This included income diversity (integrating fisheries and fish trade with agriculture and other trading activities), and mutual support mechanisms (such as informal credit and savings).

In Cameroon (Box 19), there were many sub-groups within the categories of fishers and processors, defined by the level of activity and capital invested (large- to small scale, commercial to subsistence). In general, the fish trade was an important part of their livelihoods and provided for their families needs. The traders and merchants, who controlled and coordinated the fish trade (both fresh and processed) were judged to earn a good income from these activities. This was also the case for the transporters, which was considered to be a very profitable activity. By contrast, both the fish-packers and fish retailers highlighted some of the difficulties associated with their livelihoods. Fish packing was a very strenuous activity (more suited to younger men), while fish retailers had to carefully manage fish preservation (in case of unsold fish), their cash flow, taxes to be paid to government agents, and the setting of prices. The consumers consisted of a wide variety of people, both local to the fishery, and in urban centres. There is a high demand for fish (often considered a cheap and available source of protein). Some concerns were expressed as to the availability, quality and price of fish. Finally, the main formal organisations involved with the fish trade were MINEPIA (National Fisheries Department), some banks and credit providers (e.g. Le CACID/Le Credit du Sahel), and local government. All of these organisations have on-going programmes related to fisheries management and development, but it is difficult to make an assessment of their overall performance.

In the Central African Republic (CAR) (Box 19), although the fisheries have an estimated potential production of up to 60,000 tonnes per year, and at least 10,000 fishers, all activities, including the fish trade, had been severely disrupted by civil war. There had been significant displacement of population, with many fishers migrating to Chad. In addition, the fish trade is made difficult by a lack of good roads and transport, and very limited government activity in terms of policy, planning and development initiatives.

In Chad (Box 20), the fishers were made up of both professional (full-time) and part-time fishers, who usually integrated fishing and farming. The fish processors (often part of fishing households) consisted of both men and women. Both groups (fishers and processors) indicated the great importance of fisheries and the fish trade to their livelihoods. The transporters of fish (also other goods)

Box 19: LCB Fish Trade Stakeholder analysis – Cameroon and Central Africa Republic

Country / Key Stakeholder	Livelihood features	Relations with other stakeholders	Future prospects
CAMEROON (Belal, E., Njamen, D., and Baba, M.O., 2003)			
Les Pecheurs (Fishers)	- many sub-groups depending on level of capital invested; activities in general support livelihood needs	- generally good relations with other stakeholders;	- fishing incomes will be linked to factors such as climate and resource availability; -
Les Transformateurs (Processors)	- many sub-groups defined by amount of fish handled/timing of activity; - support needs;	- generally good; - some conflict between groups (competition);	- generally optimist because of high demand for fish; aware of possible negative impacts on fish supply;
Intermediares (Intermediaries)	- involved in transactions between other stakeholders; switch to other activities?;	- very good relations with others; offer various of assistance;	- livelihoods depend on success of fisheries (good/bad seasons)
Les Grossistes (wholesaler)	- two types: fresh and processed sub-sectors; - able to meet needs; - supply-demand management;	- good relations with fishers, processors, retailers; ; some problems with transporters;	- current benefits (and livelihoods) may be affected by fish stock decline;
Les Transporteurs (transporters)	- grouped by type of vehicle (cars, lorries, buses etc); considered very profitable;	- good relations with wholesalers (principal clients);	- like to maintain fish transportation as important part of activities in future;
Les Manutention-naires (fish packers)	- undertake packing and other manual work in market (hard work); prefer to seek other employment;	- good relations generally with other stakeholders;	- prefer to move onto other types of work (fisheries or other sectors);
Les Detaillants (retailers)	- the end of the distribution chain; fresh and processed retailers; many difficulties of operation (taxes, cash-flow, price-setting, fish preservation);	- variable relations with other stakeholders; not easy to resolve operational problems;	- uncertain (because of operational problems and fluctuations in fish availability and quality);
Les Consommateurs (consumers)	- wide variety of people	- relations variable due to price, availability, quality;	n.a.
Les Institutions: MINEPIA Le Cacid Le Credit du Sahel Les Communes	MINEPIA is lead government organisation working on all aspects of fisheries; CACID works with local fisheries; Le Credit du Sahel (bank) is concerned with finance; Les Communes (Local Gov) also involved in all aspects;	- relations vary by locality and some issues are more difficult than others (e.g. taxation vs. credit);	- all the institutions want to contribute to improved fisheries development in future;
CAR (Ndjikara, E., Guiyama, D.T., and Yandji, E , 2003.			
Fishers/processors Merchants Consumers National Agencies	CAR has potential fisheries production of 50-60K tonnes; 9,000 fishers. However, trade and livelihoods in this sector has been significantly disrupted by war. Population has been displaced, transport is difficult, government sectoral policies and plans are weak.	n..a	n.a.

Box 20. LCB Fish Trade Stakeholder analysis – Chad

Country / Key stakeholders	Livelihood features	Relations with other stakeholders	Future prospects
CHAD (Magoma, O. 2003; M. Le-Naimian and Magomna, O. 2004)			
Les pecheurs (fishers)	- consist of both professional and part-time fishers (also farmers);	- extended family relations important in all activities;	Generals comments: In general, fisheries in Chad face a range of constraints: - failure to control the quality of products; - problem of fish product preservation (avoiding post-harvest losses); - coping with variability of production (and supply) due to environmental fluctuations; - weakness of fisheries planning and management; - weakness of road and other infrastructure (transport); - impact of powerful actors on the fish trade overall (inequity); - need for sector to be better organised;
Les transformatrices et les transformateurs (fish processors, women and men)	- both men and women involved (groups); - sales to merchants (using credit)	- generally good amongst immediate group; and with merchants (mutual)	
Les transporteurs (transporters)	- potentially a very profitable activity, but risky due to poor state of roads and charges by various government agents;	- good relations with merchants and retailers; - less good with government agents enforcing taxation;	
Les mareyeuses et les mareyeurs (wholesale fish merchants, women and men)	- distribution of fish products, but also finance fishing through credit and loans; - groups (including women) often hiring out nets; sharing profits with fishers;	- close links with fishers, processors and transporters (linked to financing, but also family ties); - certain merchants have established exclusivity agreements with fishers (rights to buy their fish);	
Les commercants d'engins de peche et les fabricants d'embarcations (gear suppliers and boat-builders)	- supply of gears and boats to fishers;	- generally good with other stakeholders;	
Les detaillantes (retailers)	- purchase fish from merchants (often on credit) and sell in main markets;	- generally good, but depends on supply and quality of fish (some disputes)	
Les consommateurs (consumers)	- end of fish supply/trade chain;	- have to accept products supplied;	

Box 21. LCB Fish Trade Stakeholder Analysis – Niger

Country / Key stakeholders	Livelihood features	Relations with other stakeholders	Future prospects
NIGER (Na-Andi, M.T. 2003)			
Pecheurs (fishers)	- often long-term professionals, many nationalities, migratory and often integrated with farming; a difficult life overall;	- good with merchants, who also provide finance; fishers not well-organised, not aware of micro-finance system;	- very dependent on relations with merchants; and future environmental conditions (return of Lake Chad?);
Intermediaires (intermediaries)	- this activity flourishes when the fishery is very active; involves in buying and selling fish; people undertake other jobs at other times;	- good relations in general with other stakeholders;	- depends on state of environment and resultant fishery;
Transformatrices (fish processors)	- mainly women; buy fresh fish (on credit) from fishers; process (fry/smoke); many livelihood weaknesses due to lack of credit, organisation and changing environment;	- generally good relations with other stakeholders;	- will they be able to overcome constraints of limited credit, weak organisation, and cope with changing fishery (lake recession/return)?
Commercants (merchants)	- most influential stakeholders in fish trade; principal source of credit; informal organisation; well-established livelihoods;	- generally good relations with other stakeholders;	- to maintain fish trade and livelihoods wish for lake waters to return, mending of trade roads, organisational / institutional support from development partners;
Detaillants (retailers)	- buy fish directly from fishers for re-sale; livelihoods improved with return of lake; coping by income diversity;	- good relations with fishers especially;	- linked to state of fishery (and lake waters) principally;
Transporteurs (transporters)	- well-organised group, take charge of fish shipments to Nigeria; been constrained by lack of fish and poor roads;	- good relations with fishers and merchants especially;	- depends on conditions of fishery (and roads); some have moved to Nigeria already;
Manutentionnaires (fish packers)	- mainly young men; well-organised; manual work; good livelihood when fishery is active (otherwise farming);	- good relations with fishers, merchants, transporters;	- depends on condition of lake and fishery;
Consommateurs (consumers)	- locally buy fresh and processed fish; strong demand;	- good relations with other stakeholders, although export trade limits local supply;	- depends on supply (lake size and export trends); strong demand for fish protein to increase;
Departements des peches (Fisheries Depts)	- responsibility for management of fishery; constrained by lack of finances;	- generally good relations with other stakeholders;	- support for work needed;
Micro-finance	- various schemes, some via Government, others NGOs; often working with groups; some success with disbursing and recovery of funds;	- generally good relations;	- further schemes needed in the region;

Box 22. LCB Fish Trade Stakeholder Analysis – Nigeria

Country / Key Stakeholder	Livelihood features	Relations with other stakeholders	Future prospects
NIGERIA (Ladu, B.M.B., Ovie, S.I. and Sule, O.D., 2004)			
Fishers	- mainly men, activity often integrated with farming; good income (N60K/month) and livelihood base;	- generally good mutual relations with other stakeholders;	- many fishers want government assistance (soft loans) to buy more inputs (gear), to secure future;
Fish processors	- mainly fishers processing own catch; some small (independent) processors who sell catch in S. Nigeria;	- independent processors often not local; good relations with fishers and merchants;	- fisher processors and independents want government credit to upgrade facilities (kilns, electricity, refrigeration);
Fish sellers	- receive processed fish from fishers/processors, sell to buyers for commission (N50K/week); good source of income and livelihood (improved in recent years);	- good relations (long-established) with fishers/ processors and buyers; credit to fishers/ processors; strong Fish Sellers Association;	- long-established and knowledgeable group, livelihoods stable and improving, and expecting to continue in this way;
Fish buyers	- buy processed fish from fish sellers; long-established and well-organised trade to city markets in S. Nigeria; high income (N250K/month);	- good relations with fishers/ processors (via fish sellers); fish sellers, and fish packers; provide credit; pay tax to government agencies (N2.25K/load);	- long-established and knowledgeable group, livelihoods stable and improving, expecting to continue; concerns over transport costs, highway robbery, government agents; looking to buy own trucks (gov credit?);
Transporters	- not separate group- part of Fish Buyers activities; truck owners rent to any sector; cost to hire truck is N100-150K per rtn trip to S.Nigeria;	- good relations with fish buyers;	Cost of transport to continue rising (higher fuel costs, variable road maintenance, cost of imported spares); impact on fish trade uncertain?
Retailers	- dominated by women, especially in S. Nigeria; often long association with trade; income: N40-50K/month (stable livelihood);	- good relations with merchants (e.g. fish buyers from Baga); cooperation in retailers association; credit arrangements work;	- recent variation in supply/cost of fish from merchants (cost fuel, civil unrest); conflicts with middle-men; these factors will increasingly affect livelihoods;
Consumers	- high demand for LCB fish in S. Nigerian; regular and cheap (?) supply of protein;	- consumers and retailers often have good relations (credit extended);	- demand to increase in future; price to increase? Will product be too costly for urban poor?
Fisheries Depts	- responsible for sectoral management; no specific fish trade policy;	- generally good with other stakeholders;	- better data for planning and interaction will need funding in future;
Micro-finance institutions;	- minimal impact on fish trade;	- minimal interaction; problem of collateral;	- credit schemes might be designed for fish trade;
National Planning Commission	- information relaid to it through Fed Dept Fisheries;	- no specific relationships;	- more information would be helpful for planning;

were involved in a potentially very profitable activity, but there were negative factors to be taken into account including the poor state of the roads in Chad and the charges (often illegal) applied by government agents (customs, police, army, local government etc) to their activities. The merchants, which included both men and women, coordinated and managed the fish trade, which was potentially lucrative. They were involved extensively in providing credit to other stakeholders (fishers, transporters, retailers), and also hiring out fishing gear and vehicles (together with specialist gear suppliers). The retailers particularly the fresh fish sellers in N'djamena worked hard to secure sales for the fish, which they had bought on credit from the merchants. While their livelihoods were reasonably secure and sustainable, they faced many operational difficulties (e.g. lack of adequate market facilities, lack of refrigeration, lack of alternative credit). There appears to be a high demand for fish in Chad (although little data to assess this), but consumers particularly in N'djamena complained of the high level of variability of fish supply, quality and price.

In Niger (Box 21), the fishers are often long-term professionals and many West African nationalities are present. Fishing and farming are also integrated by some part-time fishers. However, overall, in recent years, because of the severe environmental conditions (drought and fluctuating lake), livelihoods based on fishing and farming, and the associated trade, have been difficult and risky. In the past 3 years, conditions have improved with the return of the lake and a bigger fishery. This has also seen an increase in the number of people acting as intermediaries (or middle-men) in the fish market and trade. Many of the local fish processors are women. Although this source of livelihood is potentially good, as the fishery increases in size, it has been (and continues to be) underdeveloped and risky. This is also the case for local fish retailers, who buy fish directly from the fishers and re-sell. Women lack credit facilities to buy fish, the supply of fish is highly variable and this group of stakeholders are not well-organised (to work together for common aims). By contrast, the fish merchants are powerful, well-organised and influential in every aspect of the fish trade. Many have long-established businesses (and livelihoods), and also represent a principal source of credit for other stakeholders. The transporters are also well-organised and long-established in many cases. Although they take charge and responsibility for fish shipments to Nigeria, they face some major constraints including poor roads, rising fuel costs and a highly variable supply of fish shipments. The fish-packers are mainly young men, and they make a good income when the fishery is active, otherwise they must seek other manual work in agriculture or other sectors. The consumers for LCB-Niger fish are both local and in urban Nigeria (the main market), and demand is high in both areas. The main institutions involved in the fisheries sector are the national fisheries department and various credit organisations. The former has been constrained in its activities by a lack of support and finances. The latter has been active, especially working with NGOs, and has recorded some success in operating local credit schemes for primary stakeholders.

In Nigeria (Box 22), fishers are mainly men, and often integrate fishing and farming. This combination provides a good livelihood for thousands of rural inhabitants on the western shore of Lake Chad. Fishing households also tend to process their own catch. Fishers are believed to earn an average monthly income of Naira 60,000/month (or US$600/month); which is equivalent to six times the public service minimum wage. It is also believed that incomes and

livelihoods have improved in recent years. Fish-sellers are a well-established and successful stakeholder group, and form the middlemen between the fishers/processors and the fish merchants. They are believed to earn a monthly commission of Naira 200,000 (or US$2,000), and are also involved in proving credit to other stakeholders (mainly fisher/processors). The fish-buyers (fish merchants) are also long-established and successful, and have developed an important fish trade with the urban markets of south Nigeria. The average monthly income is believed to be about Naira 250,000 (or US$2,500/month), although much higher incomes are possible during peak fishing periods. This stakeholder group are powerful and wealthy, and family members typically travel to Mecca (Haj obligation). There is no specific fish transporters stakeholder group, as the vehicles (large trucks) are hired to carry a variety of products (fish, farm products, salt, animals etc). The retailers for processed fish are mainly women and located in southern Nigeria urban markets (Onitsha, Enugu, Lagos, Ibadan), and earn enough to support their families (estimated to be to Naira 50,000 or US$500 per month). They are usually well-established in this activity. There is a high demand for LCB fish, both fresh and processed, local and urban, and it is still a well-regarded and cheap source of protein for many people. Finally, regarding institutions, three stakeholder groups were identified – Fisheries Departments, Micro-Finance and Planning Departments. While there has been some interaction and interventions with the fisheries, trade and key stakeholders, the activities have often been constrained by a lack of information (and understanding) and a lack of finances.

5.3.2. Relations between stakeholders

The results of this initial investigation indicated that there was generally a good relationship between primary and secondary stakeholders in all five riparian countries, and that all these stakeholders involved directly in the fish markets and trade gained some benefit from these relationships in terms of sustainable income and livelihoods. The relationship with tertiary stakeholders (i.e. government organisations for fisheries management and development, and banks and credit organisations) was less clear. In most countries, it appeared that government organisations had a dysfunctional or intermittent relationship with the primary and secondary stakeholders. In some cases, the government authorities, in particular, were regarded as a ‘problem’, since, for example, they attempted to tax (both formally and informally) the trade activities.

It was also evident that some stakeholders were more powerful than others within the overall fish trade system. This meant that they tended to control, coordinate and manage the trade activities, and also received the largest amount of benefits in return. The most powerful and wealthiest were the merchants and the various middle-men (e.g. fish sellers in Nigeria), whereas the fishers, processors, manual workers and retailers were less powerful and wealthy, and their livelihoods tended to be exposed to a high level of risk and uncertainty. In between, the transporters and suppliers of gear and equipment were also exposed to a high level of risk and uncertainty, but less so than the primary stakeholders.

The relationships between the fishers, processors and middle-men and merchants will need to be further explored in the future to better understand how it has evolved and how it functions. What is clear at this early stage is that the relationship is not a simple one of ‘the powerful exploiting the less powerful

for economic gain'. This would simply confirm some of the simple assumptions made about social relations in African fisheries, and which are not that simple. While undoubtedly the middle-men and merchants are the major winners in the fish trade system, the fishers and processors in all the LCB countries have formed a close relationship which is concerned not only with the fish trade, but also provides some degree of social security in times of difficulty, some guarantee of a stable and assured price for fish, and the opportunity to access credit and loans based on trust rather than collateral.

One interpretation of these arrangements might be that the middle-men/merchants are looking after their own interests by offering some security for the rural workforce. It certainly appears that these relationships are long-standing, and have a basis in both family and community-cultural norms and practices. On the other hand, it could be concluded that the rich and powerful middlemen-merchants are simply re-enforcing a feudal client-patron relationship to extract economic benefits and to sustain this extraction. The precise interpretation will require further investigation, but probably lies somewhere between the two positions.

However, what is patently clear from the empirical findings is that the fish market and trade system is functioning very effectively under often difficult circumstances, and that thousands of households and communities are benefiting in each LCB country (except for CAR at present) from the capture, processing, and trade of about 100,000 tonnes of fish worth over US$50 million. (first sale).

If the critical relationship between fishers/processors and middle-men/merchants, and onto retailers via transporters and packers needs improving and even re-orientating in order to create a more equitable distribution of benefits, then there are also indications that the stakeholders themselves are capable of acting to make these changes. It is interesting to note that certain stakeholders have formed associations to try to cope with and challenge various issues and other stakeholders. For example, women retailers in N'djamena (Chad) and Onitsha (Nigeria) have formed associations in order to organise mutual savings and to confront government agencies over informal taxation. The merchants in major markets such as Baga have also formed associations, as have the fish-packers. Interestingly, the fishers/processors tend to be less oriented towards forming associations. There are two reasons which appear to be important for this short-fall – one, the transaction costs of organising highly mobile and dispersed stakeholders such as artisanal fishers may be too great, and two, the fishers and middle-men/merchants often make one-to-one contracts (which obviously appeal to the fishers working in the unstable and risky environment of the LCB).

Interestingly, while the relationship between primary and secondary stakeholders in the LCB fish trade is described as generally good and mutually beneficial, the government and other tertiary stakeholders are regarded as a 'problem' or tend to be remote from the activities of the fish trade, and therefore it would be inappropriate to try to assess a relationship which did not exist at all. In the worse cases, the government authorities are viewed as a threat or constraint to the fish trade because of excessive interference, mainly through informal taxation (e.g. security agents levying charges on fishers or transporters along the shores of Lake Chad or on main roads in Chad and Nigeria). In most

other situations, government agencies mandated to undertake fisheries management and development are unable to do so because of lack of financial resources, and are unable to facilitate the fish trade in any way.

5.3.3. Fish trade and livelihoods - future issues for government

It is widely recognised by many of the stakeholders in each country that while the current trade in LCB fish is generating benefits for many people in the region, the sustainability of this activity into the future will be dependent on various factors. Some of these factors are beyond the control of government (e.g. climate change or environmental fluctuations), whereas in other areas government might be able to intervene in the future. In the next section of this report, the overall policy situation and priorities will be examined in detail, but it is interesting to highlight three areas of importance for government identified from the stakeholder analysis.

First, many of the less powerful and less wealthy stakeholder groups (perhaps the poorest and most vulnerable to poverty) such as the fish-packers and some fishers indicated that when fisheries and the fish trade were unable to provide them with employment, income and a means of livelihood (during low fishing periods), then they were forced to seek alternative employment. Given the fluctuating nature of the LCB environment and fisheries, this is likely to occur again in the future. Government must recognise therefore that the alleviation of poverty in fishing communities will depend not only on fisheries sector interventions, but also on policies which encourage a diverse economy offering alternative employment opportunities for rural people (Neiland & Bene, 2004b).

Second, the LCB fish trade and the benefits generated are dependent on the demand for fish in urban markets, particularly in Nigeria. The long distance between the fisheries and markets is linked by a road network which is under threat from a lack of repair and maintenance in all the LCB countries. If LCB governments want to encourage economic development through markets and trade expansion, then greater attention will have to be given to the provision of national infrastructure.

Third, the stakeholder analysis revealed the close links and operations of primary and secondary stakeholder within the LCB fish trade, often working together to find solutions to major constraints such as limited infrastructure, the illegal taxation imposed by government agents, and the lack of general investment in the regional economy. It was also shown that the relationship with government and government institutions was often limited by the inability of these (often willing) organisations (e.g. Fisheries Departments) to under-take or sustain relevant fisheries development initiatives because of a lack of political support or basic financing. In the future, policy-makers will have to be made more aware of the value of the fisheries and trade, and convinced to provide greater support.

5.4. Policy analysis and future priorities

5.4.1. Policy analysis – a comparison of national issues

The issues concerning the Lake Chad fish trade which emerged at a national level in each LCB country are presented in Box 23, covering a broad range of

policy domains – environment, economic, social/livelihood issues and policies/institutions.

In the environment domain, a set of important issues which were common to all LCB countries were identified. In particular, the resilience and apparent abundance of the fisheries resources of the LCB, despite the fluctuating hydrological conditions which characterise the region, were emphasised. Overall, there is evidence that the water flows into the LCB are increasing and that aquatic environments are increasing – this is illustrated most dramatically in the case of Niger, where the northern basin of Lake Chad has re-flooded leading to a rejuvenation of the fisheries and fish trade. Overall, the findings of the study indicated that the fisheries resource base which underpins the fish trade is reasonably healthy and should be able to sustain the fish trade into the near future.

In the economic domain, it was generally recognised that the fisheries and associated fish marketing activities in the LCB contribute a range of economic benefits at different levels. At the local level, these activities provide employment and income for thousands of rural people, and help to underpin livelihoods, often integrated with farming activities. At the regional level, the fisheries and fish trade makes an important contribution to the economy, and gives a good indication of the potential for wealth generation (over US$50 million per annum at present) within the fisheries sector, especially when linked to large urban markets (mainly Nigeria) where the demand for fish is high. At the national level, the fisheries and fish trade of the LCB also make a important contribution to Gross Domestic Product for some countries, particularly Chad and Niger (1-5% GDP in both cases). Overall, the findings of the study have made an initial valuation of the economic contribution of the LCB fisheries and fish trade (in terms of volume and sale value). It has been shown that the fisheries can generate significant wealth, but in the future there will be a need to better understand (and assess) the full range of benefits which are generated including employment, income, food consumption and security, and livelihood support (i.e. market and non-market benefits).

In the social and livelihood domain, many of the issues which were highlighted arose from or related to issues in the economic domain (above). In general, while it was recognised that fisheries and the fish trade represent an important part of the regional economy, capable of generating significant wealth, the issue of the distribution and use of this wealth was raised as an important concern. A number of the LCB country studies revealed that while the level of activity in the fish trade is increasing, the resultant benefits are retained mainly by rich and powerful merchants, whereas the majority of participants within the marketing chain receive comparatively little benefit overall. However, it was also recognised that the distribution of benefits is complex and will require more detailed analysis in the future to understand the relative balance of 'winners' and losers' in the marketing chain, and whether the overall situation can be improved to create more winners on a sustainable basis. The country studies also identified a number of other important issues which relate to the distribution and usage of benefits. First, the organisation of the fish trade varied between countries. It was also recognised that the nature of this organisation affected both the generation of benefits and their subsequent distribution. To engage in the rural-urban fish trade (e.g. within Nigeria) required a high level of organisation and coordination of a full range of stakeholders and activities

(fishers, processors, transporters, merchants, sellers). However, while this could lead to many benefits (employment, income, food supply) for a full range of stakeholders, it was also vulnerable to capture by the rich and powerful, and the risk of their monopolising the majority of the benefits. Second, it was also observed that in many countries, the nature of interaction between rural stakeholders and government authorities was inadequate to ensure that wealth generation in the fisheries and fish trade was converted into appropriate social services and infrastructure to serve the rural population. For example, many fishing communities at the start of the fish marketing chain lack basic amenities (education and health services and clean water), but there is evidence of significant amounts of wealth (cash income) being generated in the sector and local economy. Overall, the findings of the study have revealed that, in terms of the social and livelihoods characteristics, there are both positive and negative aspects to the fish trade – there are benefits being generated for many participant stakeholders, but the system is vulnerable to elite capture, and more importantly, the conversion of wealth into social services and infrastructure in the LCB is almost non-existent.

In the policies and institutions domain, the LCB country studies revealed there are no specific policies on the fish trade and fish marketing in any of the countries. While all LCB countries had a general policy on fisheries and fisheries development, the implementation and further development of this policy was often constrained by a lack of support from central government for the relevant national fisheries administrations. In general, there was also evidence of a policy in-coherence at both national and international (basin-wide) levels, and a lack of coordination between different government departments responsible for fisheries and rural development. The limitations of the policy framework for the LCB fisheries, and the constraint which this represents for fisheries development is very important. One of the main reasons why the wealth of the fisheries and fish trade is not being translated into sustainable development in the LCB (as highlighted above) is the factor of weak policies and institutions. The most severe manifestation of this problem was revealed by the LCB country studies – there are many government agencies in the LCB which attempt to collect tax from the fishing and fish marketing operations – the stakeholders who pay these taxes do not see any evidence of the use of this revenue for the benefit of their communities and region (there is a lack of social services and infrastructure). The end result is that the stakeholders try to avoid paying any tax to government authorities and attempt to use the benefits of their economic activities as best they can to maintain the livelihoods of their households and communities. Overall, the findings of the LCB country studies have revealed that there is a lack of appropriate policies and institutions for the fisheries sector and especially for the fish trade. There is also a lack of policy coherence and administration coordination within the fisheries and rural development sectors, which continues to undermine the relationship between government and stakeholders in the LCB. This situation severely constraints the opportunities for an effective and coordinated approach to manage the use of fisheries wealth and its conversion in tangible development outcomes (i.e. welfare benefits and social services for the people of the LCB).

Box 23: Key National Issues Relating to Fish Marketing in the Lake Chad Basin

Policy domain	Cameroon	CAR	Chad	Niger	Nigeria
Environment	- fish resources resilient despite changes in environment; - good biodiversity; - deforestation problems emerging;	-fish resources are abundant and diverse, esp in NE; - when water levels drop greatly fishers migrate away;	- fish resources appear abundant and diverse; - water flows / levels have increased in recent years; - aquatic weed is a problem; - lack of fuelwood;	- after 20 years Lake Chad has flooded again; - impacted positively on fishing, farming, wildlife; -3 main fish (Clarias, tilapia, heterotis)	- dynamic nature of environment is well-recognised; - changes in village distribution; - changes in fish species; - deforestation problems;
Economic	- benefits of fish trade are appreciable (employment, revenue); - some risk to trade of fluctuating environment; - important international trade (informal)	- potentially diverse trading opportunities; - revenue has important social role; - lack of formal financial/ institutional support;	- important fish trade benefits at household level; - also GDP; - important trade (informal) between countries; - active trade but problems e.g. illegal tax;	- regional level trade many benefits (not evaluated); - national level, fish trade also important (GDP 1-5%); - vulnerability of trade to Nigerian market status;	- significant wealth generation ($millions); - many benefits at all levels (food,; income, employment);
Social/ Livelihoods	- opportunity exists to use wealth of fish trade to increase welfare (wealth is increasing by year); - benefits are not well-distributed (some stakeholders get little benefit); - fishers & retailers receive less benefits; - fish trade is well-organised (possibilities for improving distribution?)	- only three main fish markets; - trade is organised in a particular manner (cope with local conditions); - no organisation for women (important role);	- lack of fish trade organisation is a problem; - many stakeholders are held back by lack of basic infrastructure and services; - overall importance of fish trade to households recognised; - parts fish trade are expanding;	- fishing population has stabilised; - importance of fish trade (few evaluations); - nutrition and fish important; - concentration of population for fishery/trade, but no basic social services;	- fisheries and fish trade underpin varied livelihood strategies; - often stable and long-term livelihoods;
Policies/ Institutions	- no specific policy on fish trade; - taxation (both formal and informal) applied extensively; - taxation is a general problem in LCB fisheries;	- lack of specific policies on fisheries and the fish trade;	- general fisheries development policy exists (not specific for LCB); - includes fish trade; - lack support for impl'tation; - lack of monitoring; - lack of micro-finance;	- Decentral'tion important generally; - importance of local security; - land commission active; - lack of policy coordination;	- no specific policy on fish trade; - government institutions constrained by lack of funds; - no linkages between different institutions;

5.4.2. Policy analysis – a synthesis of basin-wide issues;

At a final meeting of the study team in Maroua in February 2004, the participants collaborated in attempting to synthesise the findings of their national studies into an overview of the key issues (from a LCB-wide perspective) which will affect the future contribution of the fish trade to sustainable livelihoods.

Using a SWOT (strengths-weaknesses-opportunities-threats) approach, the output of this exercise is shown in Box 24.

Box 24: Lake Chad Basin fish trade – A SWOT analysis of the future relationship between the fish trade and sustainable livelihoods

Strengths	**Weaknesses**
1.High fisheries productivity; 2.Resilience of fisheries, biodiversity and environmental diversity; 3.Strong market for fish; 4.Many social and economic benefits (employment, income, livelihood support, food security)	1.Lack of appropriate, coordinated policies; 2.Weak institutional linkages, low capacities of government organisations; 3.Low level of stakeholder organisation (some places); 4.Limited involvement of formal financial institutions;
Opportunities	**Threats**
1.Local will in participate in decentralised initiatives; 2.Regional collaboration (through LCBC); 3.Mechanism to improve micro-finance; 4.Information generation and dissemination to promote policy development;	1.Water flows decrease in future; 2.Lake recession and degradation of the environment; 3.Weak fisheries management; 4.Civil security

The 'strengths' which underlie the relationship between the fish trade and livelihoods include the nature of the fisheries which provide the raw material for the trade – LCB fisheries production is high and resilient to changes, with good biodiversity and environmental diversity (many fishing opportunities). The good supply of raw material is also matched by a high market demand for fish, particularly from urban markets in southern Nigeria. The fish trade in turn provides a range of economic and social benefits for the stakeholders involved at different stages of the marketing chain and at different levels of society.

The 'weaknesses' of the relationship between the fish trade and livelihoods include the lack of appropriate and coordinated policies to manage the relationship at a national and international level, and the associated weak

institutional arrangements and capacities in government throughout the LCB which limit the opportunities for future policy development and implementation. Furthermore, many stakeholders involved in the fish trade are weakly organised, and cannot press government for interventions to address needs, or resist the actions of powerful groups who seek to control and monopolise the benefits of the fish trade (in some situations, organisation is improving). In addition, there is limited involvement by formal financial institutions, who find it difficult to engage with the large numbers of informally organised stakeholders in the fish trade and fisheries (many of whom desire financial services to develop their livelihood activities).

The 'opportunities' to strengthen and improve the relationship between the LCB fish trade and livelihoods include trying to capitalise on the willingness of stakeholders at the local level in particular to participate in development initiatives, and also to harness their local knowledge of the fisheries and where appropriate relevant local institutions might form a basis for action (although this would require careful assessment). The opportunity also exists to build upon the collaborative arrangements established between organisations in different LCB countries through the current study. The need for micro-finance (by small-scale fish trade participants in particular) was reported frequently in the LCB country studies, and ways need to be explored to address this issue – the opportunity exists to design an approach which could be effective under the conditions prevailing in the LCB. Finally, the information generated and disseminated by the current study provides an opportunity for government policy-makers to consider future policy development in order to promote economic development and sustainable livelihoods (and other policy objectives) through the fish trade. One of the major constraints, in the past, to fisheries policy development in the LCB has been a lack of appropriate information and evidence to gain government support for new initiatives – key findings such as the economic value of the LCB fish trade (US$50 million) provide an opportunity to raise the profile of fisheries.

Finally, the 'threats' which will confront any attempts to strengthen and improve the relationship between the LCB fish trade and livelihoods include the possibility that the water flows in the LCB will decrease leading to a reduction in aquatic environments with a negative impact on fish stocks and fishing opportunities. It should be noted however that fluctuations in the hydrological regime of the LCB is a constant feature of this system, and it is important to recognise that the fisheries will continue to operate and supply large quantities of fish during 'normal' and 'dry' phases of the regime (the possibility of the LCB drying out completely and the fisheries disappearing is very small). Another threat (and probably a more serious and urgent one) is the management of the fisheries, which is considered weak by many national reports. A number of qualifications are important here – many of the LCB fisheries are either operated under open access conditions or through local (traditional) management systems, either way national (modern) government has compared little de facto involvement in management. Many of the open access fisheries are either open lake or complex floodplain or swamp fisheries, and would probably defy any form of management. In many situations, the locally-managed fisheries are often controlled by powerful members of communities, and the sharing of benefits within the wider community is limited. The commercial fish trade itself is organised and controlled by powerful people, again, and there is little government involvement (also increasing the chances

for monopolisation of benefits by a few people). Therefore, the penetration of formal government into the fisheries and fish trade management is limited, but the management systems operated by locally powerful people are not weak, but tend to favour benefits for the few, rather than wider distribution – a feature which will limit the possibilities for the fisheries and fish trade making a significant contribution to sustainable livelihoods for a larger number of people. Finally, the LCB has a history of civil unrest and insecurity, and this factor may represent a major threat to sustainable livelihoods based on the fisheries and fish trade in the future.

5.4.3. Future priorities

The LCB fisheries could in the future help to underpin significant development activities in the region. The fisheries are productive and capable of large wealth generation. However, translating this into a development process with positive outcomes for a majority of the local population will require more effective government support and interventions. As a starting point, it is recommended that each LCB country should, with the facilitation of the LCBC:

(i) establish a better understanding of the context of the fish trade: - undertake a detailed assessment of national fisheries policy and the relationship to other policy areas (e.g. fiscal policy, trade policy) which affect the relationship between the fish trade and people's livelihoods.

(ii) establish a better understanding of the benefits generated by the fish trade and the beneficiaries: - design and implement a programme of research to characterise the operation of local, regional, and national marketing systems, the roles of the different stakeholders involved, the benefits which they receive from participating, and the relationships between the different stakeholders in controlling benefit flows.

(iii) identify opportunities and mechanisms to promote an increased flow of benefits from the fish trade to stakeholders: - to include a range of approaches including new stakeholder organisations, and additional skills for existing organisations, technical advice and support on product development and marketing, market facilities and transportation, and by addressing existing constraints to fish trade operations (e.g. illegal taxation, bureaucratic barriers, weak infrastructure, and limited finance).

(iv) establish an enabling environment for the implementation of mechanisms to promote benefit flows for sustainable livelihoods: - provision of capacity-building for the development of stakeholder organisations covering a full range of areas including policy, legal, management and financial skills, involving NGOs where appropriate, national and regional government institutions make available technical advice and support on product development and marketing, design of market facilities and transportation, and the implementation of a management plan to address existing constraints (e.g. control of illegal taxation by government agents, reduction of bureaucratic barriers, increased infrastructure, and provision of micro-finance).

6. USING FISH MARKET AND TRADE INFORMATION IN THE FISHERIES MANAGEMENT AND POLICY PROCESS: ASSESSING THE LCB FISHERIES INFORMATION SYSTEM

6.1. Overview

The fisheries of the Lake Chad Basin have been investigated and documented using a range of different methods and approaches since 1800, as explained in Section 3 (above). More recently, a range of scientific methodologies have been used, with varying degrees of success, to explore the fisheries from a multi-disciplinary perspective. In the most recent international project, under the DFID/FAO SFLP, a combination of approaches including market/trade-based monitoring, stakeholder analysis and policy analyses have been used to investigate the fisheries (particularly the fish trade), to identify and then prioritise a range of opportunities for intervention by policy-makers in order to improve fisheries management and promote sustainable development. In this penultimate section, the above approach will be evaluated, to consider its advantages and disadvantages, and the possibilities for using an information system based on fish market and trade monitoring more widely in fisheries management and policy in West Africa.

6.2. Fisheries policy and management: Performance assessment and information needs

It is important to consider the types of information which are needed for fisheries policy and management, and the methodologies and approaches which are used.

Policy can be defined as course of action proposed or adopted by those with responsibility for a given policy area, and expressed as formal statements or positions. In most countries, the policy process, as undertaken by government, involves both the development and design of policy and its subsequent implementation across the full range of national sectors. Policy analysis attempts to provide a better understanding of the policy process. For example, by identifying the level of policy performance (e.g. have policy objectives been achieved? And to what level?) and the factors which have produced this, which might be addressed in the future to improve policy performance.

In the fisheries sector, fisheries policy as defined by government is implemented through fisheries management systems. FAO (1997) uses the following working definition of fisheries management:

"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 the accomplishment of other fisheries objectives" (p.82)

Fanning (cited in Flewwelling 1994), in a similar vein, identified three major linked components of a fisheries management system as follows:

Stage 1: Data gathering and analysis;
Stage 2: Decision-making or fisheries management planning;

Stage 3: Implementation of management plans;

The success of a management plan which is implemented (Stage 3) will be determined by the effectiveness of the decision-making and planning process (Stage 2) which precedes it, which is in turn dependent upon an appropriate information base (Stage 1).

An appropriate information base for fisheries planning and management should be multi-disciplinary, and cover the following five information types:

- biology of the fishery resources (e.g. fish stock productivity);
- environmental trends (e.g. impact on fish stock status and dynamics);
- economic characteristics of the fishery (e.g. economic returns);
- social aspects of the fishing communities (e.g. employment);
- institutional arrangements (e.g. organisations and rules in management);

In assessing a multi-dimensional activity such as fisheries management, a balance need to be struck between management's performance in relation to the different dimensions identified. A range of performance indicators can be used to assess the performance achieved, each requiring particular types of information, as highlighted in Box 25, and explained below.

Box 25: Performance indicators & basic information for assessment of fisheries management

Indicator	**Justification**	**Examples of information requirements**
Biological domain		
Output & biological productivity (MSY)	High and stable output is often considered desirable, especially if auto-consumption is important; MSY is the usual management goal;	- catch data; - catch and effort data;
Environmental domain		
Species composition and diversity	Maintenance of species composition and diversity show environment is stable and unaffected by fishing;	- catch data;
Economics domain		
Economic productivity	Productivity of economic operations within the fishery can be used as a management objective. Measures can include total and factor prroductivity (e.g. labour, capital)	- catch and effort data; - price data & cost; - employment data; - vessels in operation
Profitability	Can be used as an indicator of the status of the fishery; also to explain movements of capital;	- Catch and price data; - Fishing cost and effort;
Resource rent maximisation	Associated with goal of MEY; accords to the economic welfare maximising level of fisheries exploitation;	- catch and effort data; - Fishing cost and effort; - Catch and price data;
Revenue generation	Gross revenue (market value of catch) used as crude indicator of the economic productivity of the fishery	- catch data; - price data;
Social domain		
Catching sector employment	High employment often a goal of management, in regions of low alternative employment	- employment data; - vessels in operation;
Fishers' incomes	Maintaining or improving incomes often a management objective; incomes used as an indicator of socio-economic status of communities;	- catch and price data; - fishing cost data
Income distribution	Increased equity of income distribution is a desired goal of many management systems;	- income data - social strata or groups
Institutional domain		
Fishing rules and laws	Fisheries management will be implemented through agreed laws and rules;	- fishing practices - fishing rules & laws
Fisheries organisations	A range of organisations will interact with fisheries management, public/private; formal/informal; contribute to implementation;	- fishing practices - organisational audit; - organisational profile;

Biological success requires that management regulates the harvest so that it does not exceed the long-term productive capacity of the target stocks. Biological success will underpin social and economic success. The basic types of data required for the assessment of management of biological success in fisheries are catch and effort data.

Environmental success requires that management regulates the harvest and other fisheries sector activities (e.g. processing, ancillary industries and aquaculture) so that the resilience of the ecosystem is not compromised or undermined (e.g. avoiding disruption to food chains through removing top-predators or through excessive pollution). Catch data is an important starting point for assessing environmental management in fisheries.

Economic success requires that fisheries are operated in an efficient manner, avoiding problems of over-capacity. This will determine and affect the range of choices available to stakeholders. A key issue in economics is the resource rent that the fishery is capable of generating. Success requires that this rent is either capitalised (into the price of a right) or extracted (as a royalty). Leaving the rent in the fishery can lead to its dissipation through excess levels of exploitation. The main data types required for management assessment in this domain are catch and effort data plus costs and prices.

Social success requires that fisheries contribute to social welfare in a manner considered to be equitable. Through the political process, choices will have to be made. For example, in some places it may be preferred to use fish resources to provide livelihoods to resource-dependent communities; in others the choice may be to use the wealth of the resource more widely. The main data types required for management assessment in this domain are employment, vessel numbers, prices and costs, and on social composition and income.

Institutional success requires that appropriate organisations and rules are in place to design, develop and implement fisheries management plans based on policies agreed by stakeholders or their representatives. The degree and nature of stakeholder participation will depend on the governance context (e.g. balance of power between stakeholders, type of government). The main information types required for management assessment in this domain are fishing practices and patterns, rules and laws, and organisational profiles and audits.

6.3. Designing an appropriate information system: key criteria, utility and trade-offs

There are at least six important criteria for designing an information system to support the policy process and management in fisheries as summarised in Box 26.

An important first (starting point) is for the end-users (e.g. government policy-makers or fisheries managers) to define their management objectives and then to specify their information needs (the information system must be pertinent, and not simply generate information on a broad front, which might prove to be useful at some stage). It is also important to consider the types of information products which the end-users might expect and find most useful (e.g. briefing papers are often more useful than large reports for busy decision-makers). Secondly, the organisation(s) involved must have the institutional capacity

(skills and man-power) to operate the information system, and thirdly, the methodologies applied must be appropriate. Fourth, a key issue is that of budget. Information systems can be very costly, and the design must reflect the budgetary resources available (and no more). Fifth, the support and participation of relevant stakeholders is important. Sixth, stakeholder support is likely to affect the sustainability of the information system, and other important factors must also be considered from the outset (e.g. a donor-supported project may development an information system, but is this sustainable once the project has finished?). Seventh, the quality of the information outputs must be carefully assessed and validated. A well-established procedure for this will help to maintain the credibility and worth of the information system as an important decision-support tool (DST) for policy-makers and fisheries managers.

Box 26: Designing a fisheries information system: key criteria

(1) **Pertinence and products**: It is vital for the end-users (e.g. government policy-makers and fisheries managers) to define their fisheries management objectives and relate them to information needs and the types of information products with highest utility;
(2) **Institutional capacity**: the ability of relevant organisations to operate an information system must be assessed (e.g. are the necessary skills and man-power available?);
(3) **Methodologies**: fisheries systems can be complex and not all study and monitoring methods are interchangeable, therefore are appropriate methodologies available for specific fisheries?
(4) **Cost**: what budget is available to operate an information system (e.g. collect, organise, analyse data, report findings, train staff, buy and service equipment?);
(5) **Stakeholder support and participation**: the successful operation of an information system will depend, in part, on the support and participation of relevant stakeholders at different levels (e.g. fishers, processors, merchants, government staff, consumers). To what extent is the importance of the proposed system recognised?
(6) **Sustainability**: what other factors are likely to affect the future sustainability of the system? Is there any past and similar experiences to draw upon?
(7) **Assessment and validation**: what arrangements can be put in place to ensure that the information system is regularly assessed (independently) and the outputs validated?

Clearly, the design of the information system will require careful consideration of likely trade-offs between key design criteria outlined in Box 26. For example, decision-makers might like to have very detailed information on fish stocks, fishing capacity and economic returns, and to have this information used in sophisticated bio-economic models, which would allow the determination of optimum fishing effort and capacity. This approach would need to be underpinned by an appropriate (high) level of institutional capacity (e.g. computer modellers), well-tested field methodologies to collect relevant data, and an appropriate budget to ensure the required level of data collection (e.g. necessary coverage of a large fishery to ensure statistical significance could be very expensive). All of these factors would need to be considered in relation to each other, and where certain constraints are encountered (e.g. a small budget, poor institutional capacity or untried methodologies) then certain compromises

and trade-offs between the factors involved would need to be made (until the constraints can be overcome in the future). This could involve a re-think in terms of methodology, in order to find alternatives ways of satisfying the end-users needs. It is very important for the end-users, the operators of the information system (scientist and administrators) and the other stakeholders involved to agree with the design process, and to understand the methods used and outputs which are generated. The creation of a sense of shared ownership of the information system, which will underpin decisions within the fishery management system, is important overall for the sustainability of these operations.

6.4. Using a fish market and trade-based approach for fisheries monitoring - an assessment of the LCB design (strengths and weaknesses)

The methodology for the characterisation of fish markets and trade which is described in Section 4 (above), and which has been used successfully in the Lake Chad Basin, as a basis for a relatively simple fisheries monitoring system, is the culmination and a by-product of over 10 years research in this region. In the following sub-section, the design will be assessed, in terms of its strengths and weaknesses, using the types of criteria outlined in Box 26 above. Clearly, the outcome of this assessment has implications for the wider and generic application of this approach in other fisheries.

Before proceeding with this assessment, it is worth reminding the reader of the key features of the LCB information system (Section 4, Box 9). In summary, four work-packages (Fisheries Information Monitoring System (FIMS); Stakeholder Analysis; Policy Analysis and Context Studies) generate three categories of information – basic trade statistics (geography of the fish trade, fish product types, volumes and values), stakeholder relations and trade organisations (key stakeholders and livelihoods, relationships between key stakeholders, future issuses for government) and policy analysis and future priorities (policy analysis –national, basin-wide, future priorities).

The main strengths and weaknesses of the LCB information system are as follows: First, the main **strength** is that information generated is pertinent to the current and future policy and fisheries management decision-making needs of the riparian national governments. For all the governments, major concerns include the sustainable management of the fisheries for food production, livelihoods and incomes with the regional and national economies. The use of the three complementary categories of information and analysis – trade statistics, stakeholder analysis and policy analysis - has helped to highlight policy development opportunities for the future. The possibility for policy development and the alignment of the LCB information system to contribute to this process are important options for the future. The main **weakness** in the area of pertinence is that many of the national fisheries policies are very broad-based. While they do recognise the importance of fisheries, and set out national objectives, some of the objectives can be mutually exclusive (e.g. exports vs. food security). The difficulty for many countries is to translate broad policy statements into workable fisheries management systems. One of the main reasons for including stakeholder analysis and policy analysis in the LCB information system was to try to contribute to policy development (to address the overall weakness and highlight some priorities for action on the ground).

Second, what were the strengths and weaknesses regarding capacity? The LCB information system was designed with reference to institutional capacity in the five countries. In terms of **strengths**, the majority of the institutions involved were staffed by well-trained fisheries biologists, with some agriculturalists, economists and engineers. In addition, the majority of staff had also received some training in socio-economics, policy analysis and livelihood studies. There were relatively few staff skilled in areas such as economics, stock assessment modeling and bio-economic analysis. In addition, many of the institutes involved did not have a large staff complement or large budgets. It was also noted that many of the national staff had a good knowledge of local fisheries and the local stakeholders (e.g. fishing communities and traders), and were experienced in undertaking fieldwork where close liaison and meetings with stakeholders (e.g. group meetings) were concerned. The LCB information system was designed therefore to capitalise on the local capacities and skills, with an emphasis on the collection of basic fish trade statistics, stakeholder analysis and policy analysis. The main **weakness** of the LCB fisheries information system with regards to institutional capacity is that the information generated would benefit from the analytical attention of other experts – particularly in economics and market analysis, also social, anthropological and political analysts. The processing and analysis of market data would have also benefited from database management expertise in some countries. The difficulty is to decide where the additional capacity should be created. If each country had additional budget, should the decision be to increase the institutional capacity or to extend the coverage of the information system in time and location?

Third, what are the **strengths** in terms of methods and costs? The methodologies and cost issues for the LCB information system had to be considered together. The LCB environment is large, remote, complex, dynamic and relatively inaccessible – it is dominated by a large area of seasonally-variable swampland with Lake Chad open water at the centre. The fishery cannot be easily (or at a cost-effective level) investigated using conventional fisheries methodologies such as stock assessment using sampling surveys, or catch assessment surveys based on local fisheries, or using cost-earnings surveys to generate economic data, for eventual use in stock, surplus yield or bio-economic models. However, as first recognised by Stauch (1957), it is possible to gauge the activity and production of the LCB fisheries by monitoring the markets and the trade routes. These are relatively limited in number and well-known, and since the majority of fisheries production is traded along these routes, they represent a good opportunity for in-direct fisheries monitoring. By coupling the quantitative trade monitoring undertaken by the FIMS with other qualitative techniques such as stakeholder analysis (a participatory approach), and policy analysis (desk-based), a range of interesting and pertinent perspectives and information types could be quickly established at relatively low cost. The total annual budget per country was US$20,000 or US$100,000 for the LCB as a whole. The cost LCB information system represented <0.2% of the annual market value of LCB traded fish (US$54 million). What were the **weaknesses** of the methodologies and the cost factors for the LCB information system? The methodologies used do not provide a complete coverage of the types of information or assessment one would conventionally expect in fisheries management - the status of the stocks or fishing capacity or biological and economic productivity is not known in precise terms. It can be argued, however, that these conventional assessments are inappropriate for a large wetlands fishery system. What is more important is to

have some indicator of the production and value, which can be generated relatively quickly and pragmatically using locally-available capacities for use by policy-makers. At the present time, there is no way to assess the statistical significance of the trade statistics generated. In all the surveys undertaken, an attempt was made to either carry out a census of all trading activity in particular markets or routes, or to aim for the largest sample possible given the resources available for the work.

Fourth, with regards to the participation of fisheries stakeholders, this was one of the main **strengths** of the LCB information system. As part of the development and implementation of two of the main components – FIMS and Stakeholder Analysis – the national study teams actively encouraged the participation of a wide range of stakeholders (primary, secondary and tertiary). This often involved drawing upon existing well-known contacts, established through normal work duties in the field, but also seeking out new stakeholder groups where possible. Care was taken to inform the stakeholders of the purpose of the work, to inform them of the results and to discuss the findings. The national study teams all indicated that primary and secondary stakeholders in particular were keen to put forward their views and there appeared to be considerable potential for establishing future collaboration in development initiatives – people in the fisheries were concerned to explore ways in which constraints to development could be overcome, and new opportunities taken up. What were the **weaknesses** regarding stakeholder participation? The project had only limited resources, and so the selection and inclusion of the various stakeholders (fishers, processors, merchants, consumers , government staff etc) was based largely upon the expert opinion and experience of the national study teams. This may have introduced some biases into the sample of stakeholders interviewed, and it will be important to consider how to address this issue in similar future initiatives.

Fifth, there are both strengths and weaknesses associated with the sustainability and validation of the LCB fisheries information system. The main **strengths** of the system are its simplicity and relatively low cost. In addition, it provides easily accessible methods and results, which can be appreciated by, and involve a full range of stakeholders. At least two countries in the LCB – Nigeria and Cameroon – have indicated that they will continue operating the system as part of normal fisheries department activities. The simplicity of the system also ensures that assessment and validation can be undertaken relatively easily. The main weakness for sustainability is that even this relatively simple fisheries system does cost at least US$20,000 to implement on an annual basis, and for some countries in Africa, where other policy priorities are uppermost, the funds may not be available from central government, once international donor-funded projects have exited.

6.5. Applying the LCB fisheries information system in other countries

The development and implementation and results of the LCB fisheries information system have been reported in detail above. To what extent might this system and the underlying approach be used in other fisheries in Africa? There is clearly no simple answer to this question, since fisheries systems and the associated institutional and political arrangements vary so much from country to country. It is unlikely therefore that the LCB fisheries information system could be transferred without modification. The most important lesson

from the LCB experience is that tropical fisheries, despite their inherent complexity, can be investigated and monitored, in order to contribute to improved fisheries management for development, by using suitably pragmatic methods which capitalise on particular opportunities and strengths. In the case of the LCB fisheries, the trade and market system provided a vital entry-point for fisheries monitoring. In other fisheries, this may also be the case, but not in all fisheries, where other opportunities will need to be explored.

The design and implementation of the LCB fisheries information system was a gradual process, over a number of years, as part of a series of international projects. A summary of the process is provided in Box 27.

Box 27: Summary of the development of a fisheries information system

Step 1: Definition of fishery system: key actors, locations, flows, background studies;

Step 2: Definition of fisheries policy and management system: policies, objectives, policy instruments, policy analysis;

Step 3: Definition of information needs by decision-makers: types, frequency, reporting formats;

Step 4: Design of pilot fisheries information system: based on Steps 1-3 plus design criteria: institutional capacity, methodologies, budget, stakeholder participation, sustainability factors and assessment/validation procedure;

Step 5: Basic specification of pilot design: (i) basic statistics (possibility of using market/trade framework; or Fisher Frame-survey and CAS; or Census of fishers and other stakeholders; (ii) Stakeholder analysis; (iii) Policy analysis; (iv) Context studies;

Step 6: Capacity-building for pilot design: (i) Data collection, processing and analysis; (ii) Stakeholder analysis; (iii) Policy analysis; plus report-writing;

Step 7: Implementation of pilot fisheries information system (12 months): (i) data collection; (ii) analysis; (iii) reporting; (iv) appraisal; (v) refinement of design;

Step 8: Design, implementation of full-scale fisheries information monitoring system: drawing upon pilot-scale results, commitment from central authorities, participation and support from other stakeholders, who recognise worth of system;

Finally, it should be recognised that the development of the LCB information system depended on the following components: the gradual accumulation of knowledge and experience of the fisheries by the national study teams (and their collaborators from donor-funded projects); the use of this experience to identify opportunities for monitoring (in this case the trade and market system); the use of targeted capacity-building to increase the skills of the scientists and administrators involved; and importantly, the emergence of the support and collaboration of stakeholders at all levels, recognising the value and contribution of the information system for sustainable fisheries development. Finally, although the development of the information system has relied to some extent on external funding through donor projects, there are encouraging signs

that a number of the LCB countries will continue operating the fisheries information system as part of their national fisheries administration.

6. CONCLUSIONS AND RECOMMENDATIONS

The results of this study have confirmed that:

(i) Livelihoods and poverty: - the total volume of fish traded in the Lake Chad Basin between 2002 and 2003 (12 months) was 119,034 tonnes (wet weight) valued at US$54 million (first sale). The majority of the fish (in the form of smoked and dried products) was sent by truck to the urban markets of southern Nigeria through well-organised, but often informal, marketing channels. The LCB fish trade provides a range of benefits at different stages of the marketing chain, and at different levels of society including employment and income for thousands of people. The LCB fish trade is recognised as underpinning the livelihoods of many of these people, although there are no accurate statistics available to gauge the total numbers involved. The results of stakeholder analysis in each country confirmed that while the major merchants and middle-men traders controlled the marketing process, and secured a majority of the benefits, the relationship with other stakeholders (e.g. fishers, processors, retailers) was not entirely exploitative. There was evidence of a close working relationship between the merchants/traders and the other stakeholders which ensured that the trade worked well even under difficult circumstances (e.g. fuel shortages, illegal taxation). It could be theorised that the merchants/traders accepted some responsibility for the livelihoods and welfare of other workers on the basis of the findings of this initial study. However, this would have to be investigated further to provide a better understanding.

(ii) Policy and policy performance: – overall, the LCB country studies revealed that there is a lack of appropriate policies and institutions for the fisheries sector and especially for the fish trade. There is also a lack of policy coherence and administration coordination within the fisheries and rural development sectors, which continues to undermine the relationship between government and stakeholders in the LCB. This situation severely constraints the opportunities for an effective and coordinated approach to manage the use of fisheries wealth and its conversion into tangible development outcomes (i.e. welfare benefits and social services for the people of the LCB). The work of the LCBC has been constrained in recent years by a lack of funding and support, and progress has been slow in attempting to galvanise and coordinate policy development and implementation for the basin as a whole.

(iii) Future policy priorities and recommendations: - it is recommended that each LCB country should, with the facilitation of the LCBC and other international organisations:
- establish a better understanding of the context of the fish trade; undertake a detailed assessment of national fisheries policy and the relationship to other policy areas (e.g. fiscal reform, trade policy) which affect the relationship between the fish trade and people's livelihoods;

- establish a better understanding of the benefits generated by the fish trade and the beneficiaries: - design and implement a programme of research to characterise the operation of local, regional, and national marketing systems, the roles of the different stakeholders involved, the benefits which they receive from participating, and the relationships between the different stakeholders in controlling benefit flows;
- identify opportunities and mechanisms to promote an increased flow of benefits from the fish trade to stakeholders: - to include a range of approaches including new stakeholder organisations, and additional skills for existing organisations, technical advice and support on product development and marketing, market facilities and transportation, and by addressing existing constraints to fish trade operations (e.g. illegal taxation, bureaucratic barriers, weak infrastructure, and limited finance).
- establish an enabling environment for the implementation of mechanisms to promote benefit flows for sustainable livelihoods: - provision of capacity-building for the development of stakeholder organisations covering a full range of areas including policy.

(iv) Study methodology and fisheries information systems: - the well-defined and developed fish markets and fish trade routes of the Lake Chad Basin were monitored on a regular basis by the study teams and this approach formed the core of the study methodology (the Fisheries Information Monitoring System or FIMS). In addition, the FIMS was complemented by participatory stakeholder analysis and policy analysis. The 3-part methodology was implemented successfully, and generated information which was appropriate for the analysis of the LCB fisheries in terms of fisheries production, trade, livelihoods, stakeholder relationships and policy analysis. The methodology had been developed and refined to suit the context, conditions and policy needs of the LCB, and could form the basis of a pertinent, cost effective and sustainable fisheries information system in the future. It was concluded that the development of the study methodology (using markets and trade as a focus) provides a good example of the type of pragmatic and cost-effective approach to information generation which could help to underpin the policy process for fisheries in other African countries. It may also be possible to use market and trade information in fisheries monitoring in other countries, but this would need careful evaluation.

(v) Markets and trade issues in Africa: - the current study within the LCB has made a contribution to our general understanding of how markets and trade operate in Africa (ref: Box 1 above). In particular the relationships between different stakeholders was found to be complex, with more powerful and wealthy groups (e.g. merchants) exhibiting some degree of responsibility for the livelihoods of other less powerful and less wealthy stakeholders. The market and trade inter-actions were not simply based on supply-demand-price incentives, but also included elements of culture and ethnicity, social relationships, and social security and the moral economy in the face of a high level of risk and uncertainty (relating to the political, economic and environmental context of the LCB). However, the exact nature of these relations will require more detailed research in the future to gain a better

understanding. The current study also revealed the importance of informal and regional trade in the LCB (ref: Box 1 above), confirming that informal trade had been undervalued and that regional trade (as opposed to international trade outside Africa) should also be given a high level of priority in future development policy.

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Appendix 1:
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