

5 CHAPTER

Supporting fisheries and aquaculture

5.1. Current status of fisheries and aquaculture

African fisheries encompass a wide range of ecological and socio-economic components. They include industrial high sea fisheries, involving international fleets under foreign access agreements, as well as small-scale fisheries in coastal and inland waters that employ most of African fishers and carry commerce and food security benefits across the continent. More recently, aquaculture has emerged as a rural income and food source, often integrated with agriculture and irrigation, but also as a market-oriented business targeting regional and export markets.

African fisheries contribute significantly to food security of an estimated 200 million people; they provide a

source of income for over 10 million engaged in production, processing and trade. Fish has also become a leading export commodity with a current annual export value of US\$2.7 billion. The role of fisheries and aquatic products in supporting livelihoods, enhancing economic growth, and improving food supply in the region is critical. Yet these are at risk as the exploitation of stocks is reaching limits and aquaculture production has not matched its potential.

Africa currently produces about 7.3 million tonnes of fish each year, of this 4.8 million tonnes is from marine fisheries, and 2.5 million tonnes from inland fisheries. While capture fisheries rose steadily throughout the 1980s and 1990s, they have stagnated since then, reaching about 6.9 million tonnes in 2002. Aquaculture production has risen, but



Women selling dried fish, C. Bene.



Young fisherman in Malawi, S. Heck.

slowly, and only in Egypt has growth achieved rates of increase seen in other parts of the world, rising from 85 000 tonnes in 1997 to 376 000 tonnes in 2002. These trends combined with population growth mean that per caput consumption of fish in Africa is low and stagnating, and in Sub-Saharan Africa specifically, per caput consumption has fallen in the past twenty years.

For capture fisheries, there is a growing recognition that improved governance systems for fisheries resources and better management of the resource base upon which they depend are needed for sustainable use, while carefully targeted investments in infrastructure and marketing are needed if the full value of these resources is to be realized by the local, national and regional economies. With growing urbanization, improved market integration and the concurrent supply crisis from capture fisheries, small and large investors are gaining interest in aquaculture production. There is urgent need, to develop guidelines and policies to create a conducive aquaculture investment climate, and at the same time provide safeguards against environmental and social risks.

NEPAD recognizes the important role of fisheries, in both inland and marine waters, for regional economic development and food security, as well as the growing opportunities for aquaculture development. Together they provide an important area for investment in support of NEPAD's objectives and the broader Millennium Development Goals. In particular, they contribute to the goals and targets of the CAADP. In this context, this chapter builds on the comprehensive technical consultation process carried out through CAADP during 2005, to identify main development options for the African fisheries sector¹. The chapter builds further on the NEPAD *Action Plan for the Development of African Fisheries and Aquaculture* (NEPAD 2005) and the regional consultative process that generated it, and identifies investment strategies to support its implementation.

5.1.1. Inland fisheries

Africa's inland fisheries provide employment and income for households dependent on fishing and post-harvest activities. They provide the principal source of animal protein and essential micronutrients for millions of rural and urban-based poor. Yet catches from most inland fisheries have generally reached their maximum capacity, and many are now declining. Many of these fisheries are considered to be overfished, while the ecosystems that sustain them are threatened by eutrophication, deforestation, dams and other water management schemes. In the coming decades, increasing competition for water will be a major challenge for these fisheries.

With the exception of semi-industrial fisheries in a few large lakes and reservoirs, the level of private and public investments directed to Africa's inland fisheries is remarkably low. Yet in regions where inland fisheries and related activities are present, the potential contribution of these activities to the decentralized economic development process is substantial. To unleash this potential, an appropriate level of policy support and investment is required in different domains, including infrastructure and landing facilities, but above all, measures to reduce the high rate of post-harvest losses.

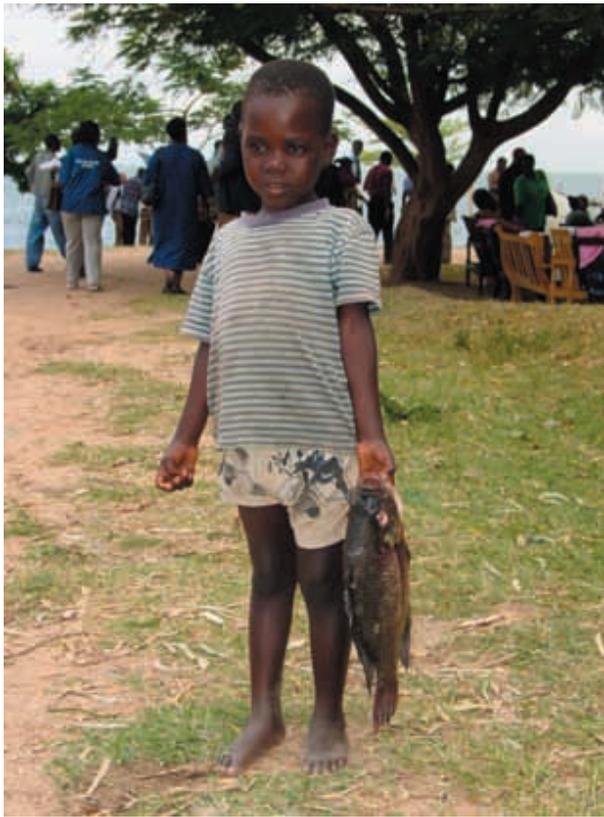
Production. In 2002, total estimated landings from inland fisheries were 2.1 million tonnes, equivalent to 24 percent of global inland fisheries production. As a proportion of total catches in Africa (both marine and inland), inland fisheries landings have increased from <25 percent (1951) to 49 percent (1999). The countries with the highest reported production were Egypt (293 000 t), Tanzania (274 000 t), Uganda (222 000 t), and DR Congo (215 000 t), followed by Kenya, Nigeria and Mali (>100 000 t each). The major fisheries included Lake Victoria (500 000 t), the River Congo Basin (520 000 t), the River Nile Basin (total catch not known), the River Niger-Benue Basin (520 000 t) and the Chad Basin (100 000 t). It has been estimated that total annual production increased by 2 percent per year during the 1980s and 1990s, yet this trend has been slowing down since then, and some of the major producers now experience stagnating or declining catches (see Table 7).

There are strong concerns that inland fisheries in Africa are increasingly under threat from environmental change, increasing land use pressure and overexploitation of fishery resources, and that current conditions of governance and management are not able to safeguard the sector's value and development benefits. What is required to move the sector forward, are a new consensus and strategy, based on improved knowledge and coherent planning and implementation approaches.

Value. In terms of product value, the total first sale value of landings from inland fisheries in Africa for 2001 was estimated at US\$1.8 billion. This is an indicative figure, based on estimated landings and prices. Some examples of the value (first sale) of inland fish landings by country reveal the level of value which is being generated – Nigeria's landings (130 000 t/yr) are valued at US\$350 million; with the same value for Mali. The more commercialised Nile Perch fishery of Lake Victoria generates an export value of over US\$600 million. Beyond these sale figures, no reliable quantified data is available on the actual wider economic value generated by Africa's inland fisheries, but it is clear that this includes significant value added through trade, processing, and associated service sectors.

Resources. The inland fisheries of Africa mainly exploit multispecies fish stocks, which are characterized by complex

¹ The main technical findings of these consultations are contained in three review papers, i.e. Neiland *et al.* 2005 *On Inland Fisheries*; Bà *et al.* 2005 *On Marine Fisheries*; and Muir *et al.* 2005 *On Aquaculture*.



Even youngsters are involved in fishing alongside elders, S. Heck and C. Bene.

interspecies interactions and adaptations to a changing environment, including extensive seasonal migrations in some species. Fish productivity varies according to specific environments, but is generally high. Excessive fishing pressure is the major factor affecting African inland fisheries at present, and in the near future, it seems highly likely that the impact of dams and other water control schemes, as well as pollution, will also be increasingly important. Fishing effort doubled between 1985 and 1996, and most inland fisheries are intensively exploited.

Fish supply and food security. In Africa, inland fisheries make an important contribution to total food supply. Among the world's top 20 countries with per caput fish supply from inland fisheries, there are 13 African countries, including Benin, Central African Republic, Chad, Congo Republic, DR Congo, Egypt, Gabon, Kenya, Malawi, Mali, Tanzania, Uganda and Zambia, and with annual per caput fish supply ranging from 4.5-9 kg. There is a general lack of data and information on fish supply and consumption in Africa, but it is assumed that most inland fish landings are utilized for human consumption, both for subsistence and increasingly as a locally and regionally traded commodity. Industrial uses for fisheries resources, such as in animal feed manufacture, are still rare but are developing more strongly around the Great Lakes.

Policy and management. Management of inland fisheries has proven to be challenging in the context of

prevailing institutional and policy conditions. The sector is highly dynamic, involving a wide range of stakeholders with diverse interests and capacities. The situation is further characterized by other activities impinging on the sector, such as urbanisation, water management and control, deforestation and agricultural activities, and industrial wastes. There is a need, therefore, to develop management systems which cope with competing uses and within an ecosystem context. The FAO Code of Conduct for Responsible Fisheries (CCRF), adopted in 1995, seeks to facilitate change and adjustment in fisheries by providing general ground rules to guide governments in realizing long-term sustainability.

5.1.2. Marine fisheries

Marine fisheries are of critical economic importance in most coastal countries. In the countries of the Subregional Commission on Fisheries² in West Africa, for example, marine fisheries generates up to 400 000 direct and indirect jobs, and more than 4 percent of the active population works in the fishery sector (fishing, processing, marketing). Similarly, in the SADC region, close to 200 000 direct jobs are in marine fisheries, and these are again generating income opportunities among larger populations. Marine fisheries

² Cape Verde, The Gambia, Guinea, Guinea Bissau, Mauritania, Senegal, Sierra Leone.

contribute significantly to national economies through exports, employment and a diversified service sector. Overall, the fishery sector is poorly integrated in the wider economy, and this is also reflected in limited accounting of its value and contribution in national accounts. While in some countries the sector contributes more than 10 percent to the agricultural GDP (e.g. Comoros, Mauritania, Mauritius, Senegal and Namibia), these figures do not capture the full economic value of this diversified sector.

Coastal and marine fisheries provide over half of Africa's fish production. As efforts are made to increase the contribution of fisheries to the continent's development, it is essential to sustain, and where possible enhance, the benefits these fisheries provide. This will require considerable investment at multiple levels to address the increasing challenges faced by coastal and marine fisheries and the conflicts these generate. At the same time, a wide range of innovative investments are needed in order to, where possible, add value to the resources that are harvested.

Production. Marine capture fisheries, concentrated along the western coast of the African continent, contribute more than 50 percent of African fish landings. Total marine production has quadrupled in the last 50 years to a level of 4.7 million tonnes in 2002. However, since the 1990s, signs of overexploitation have become increasingly evident. They include declining stocks in most fisheries (in particular demersal stocks and West African fisheries), overcapacity of fleets beyond economic efficiency, increased conflicts between fleets and a deteriorating marine and coastal environment. Detailed understanding of these trends is often complicated by a lack of reliable data, including data on stocks, fishing effort and actual catches.

Value. Total value (first sale) of production is estimated at over US\$7 billion annually, an indicative figure based on estimated averages across a wide range of fisheries and countries. Importantly, the economic value of marine



Filleting in Uganda for value addition on fish, S. Heck.

catches is multiplied through extensive trading and marketing of marine products in the region as well as internationally. Marine products constitute the bulk of Africa's US\$2.7 billion export trade, and further substantial value is generated through informal trade within coastal as well as inland areas on the continent. While this trade is not well recorded, it provides income for millions of Africans and contributes to commercial development and market penetration in remote regions. There is great scope for increasing the value of products and supply chain through investments in processing and trade capacity, in particular among small and medium scale enterprises.

An important factor affecting the value of marine fisheries for African development, is the significant portion – between 25 to 30 percent or about 1.6 million tonnes in 2001 – of fish in African waters captured by foreign fleets under specific access agreements. These catches are not landed on the continent, and there is continued concern about the value and opportunities lost for commercial development and incomes in African countries. A review of the advantages and total costs of access agreements seems warranted, and different options for capacity investment and revenue flows need to be considered.

Management and policy. It is widely accepted that the main challenge in marine fisheries (see Table 8) is to stabilise and sustain production through a combination of management interventions, policy reforms, and strategic investments towards diversification of economic activities. With few exceptions, the coastal and marine resources of the African continent are fully exploited and in many places signs of significant overexploitation and resource degradation are evident. Population pressure and urbanization of the coastal areas play an important role in this dynamic, but overcapacity of industrial fleets and artisanal coastal fisheries remains the major factor driving resource degradation. In recent decades, competition for scarcer resources has also led to increasing conflicts amongst users, in particular between local fishers and



Professional fishermen calibrating fish in Egypt, S. Heck.

larger-scale off-shore industrial fleets. However, increasingly these conflicts have taken on a regional dimension.

To address these issues, long-term fisheries management plans are needed at regional, national and local levels. These need to recognize that the transboundary nature of many stocks and the migratory feature of many fishing communities require a more collaborative approach between countries. This will in particular require harmonisation of laws and institutional frameworks, and the overall approach will need to be underpinned by major investments in capacity building, including for policy and implementation of Monitoring, Control and Surveillance (MCS) measures. In many cases, these management plans will need to address the politically and socially difficult process of reducing fishing effort in both large-scale and artisanal fisheries. The ecological sustainability and long-term economic viability of the entire fisheries sector depends on these necessary reforms.

A further important characteristic – similar to the situation in inland fisheries – is the preponderance of the small-scale fisheries sector in coastal waters. Its dynamics and potential for growth are not clearly understood, but this sector is probably grossly undervalued. It is estimated that over 90 percent of all fishers are active in small-scale operations, and it is clear that they are intrinsically linked to other sectors of the economy through supply chains as well as through diversification of their livelihoods. The physical mobility and adaptability of this sector requires innovative approaches to designing and implementing management measures.

5.1.3. Aquaculture

Aquaculture has grown strongly in most regions of the world where the potential exists, except in Sub-Saharan Africa. In the entire African region, only Egypt has achieved the scale of change observed elsewhere. In spite of decades of investment and technical input, and the continued hopes of many, aquaculture has failed to thrive where expected, and in many cases remains precarious and marginal. However, aquaculture has grown in specific conditions and contexts, and in spite of the many current economic, demographic and social challenges in the region, a more positive perspective of market-led growth, and more realistic understanding of technical potential, linked with the possibilities of broader economic regeneration, suggests that future opportunities may be much more definite.

Production. The three top aquaculture producers are Egypt, alone accounting for 86 percent of the total for the continent, Nigeria with 7 percent and Madagascar with 2 percent (see also Table 9). Production has increased, but much more slowly than in other regions. Only in Egypt has development been notable, with an increase from 85 000 t in 1997 to 376 000 t in 2002, an average annual growth of 35 percent. Current levels exceed 550 000 t. Looking



Fish pool in the Katanga Region in D.R. Congo, D. Mahongol.

at production trends by aquaculture environments (see Table 10), the growth trend since 1990 has been very positive mainly in brackish water (broadly equivalent to coastal aquaculture). There has been only a small and fluctuating increase in marine aquaculture, primarily from the Atlantic zones. Strong growth related to brackish water environments has been primarily related to aquaculture in the Nile delta, and with some growth in coastal shrimp production. By contrast, compound growth in production in freshwater culture has risen by only 7 percent annually.

UN projections suggest that the population on the African continent is set to expand rapidly, reaching 1 188 million (medium variant) by 2010. A 2003 study by IFPRI and the World Fish Center³ suggested that to maintain food fish consumption at present levels (8 kg per person/year) supplies should increase from some 6.2 to 9.3 million t per year in 2020. However, current supply trends, combined with population growth, mean that per caput consumption of fish in Africa is stagnating, and in Sub-Saharan Africa has fallen. To support future needs, capture fisheries will need to be sustained and if possible enhanced, and aquaculture developed rapidly, to increase by over 260 percent (an annual average of more than 8.3 percent) by 2020 in Sub-Saharan Africa alone.

Studies by FAO⁴ and others have shown considerable physical potential for aquaculture. For Sub-Saharan Africa, it was estimated that 9.2 million km² (31 percent of land area), were suitable for smallholder fish farming. If yields from recent smallholder projects could be replicated, only 0.5 percent of this would be required to produce 35 percent of the region's increased requirements to 2010. However, this potential remains largely untapped, in large contrast to many other regions with equivalent resources. By 2002, total production in Sub-Saharan Africa was only 79 500 t.

³ Delgado *et al.* (2003).

⁴ Aguilar-Manjarrez and Nath (1998).

Yields in most countries remain low, producers are few in number and commercial operations have yet to develop in many areas. There is urgent need to adapt successful experiences from other regions to the African situation and target investments at priority zones of current growth and innovation. The key to accelerated development seems to lie in improved investment planning and sector management, applying well structured approaches with clearly defined roles for public and private sectors.

Value. Contributions in value terms of major producer countries are shown in Table 11 for countries recording more than US\$5 million output value annually. These data, derived from FAO Fisheries Statistics, and in turn from national records, demonstrate a relatively insignificant role in most national economic accounts, though local impacts are likely to be considerable, and studies elsewhere have shown important economic multipliers in income and employment terms, with significant local impacts where production and services are clustered.

5.2. Key development issues and constraints

5.2.1. Sustaining production from capture fisheries

For many years, the objectives of fisheries management systems have focused almost exclusively on the maximization of fisheries production (or fish landings) with reference to a maximum sustainable yield (MSY) and the control of fishing effort. In many countries, fisheries departments have attempted to operate licensing schemes, both as a way of controlling the numbers of fishers, and also as a means of collecting revenue. In general, evidence suggests that this approach has not performed well. Indicators show that fish stocks are increasingly threatened by overexploitation, fishing pressure is increasing and many fisheries operate under opportunistic conditions. There are various reasons for this - lack of resources for management and enforcement, weak political support for difficult decisions, low levels of capacity and expertise in planning and monitoring, and logistical and technical problems. Clearly, these need to be targeted for support, if production from capture fisheries is to be sustained. Such an investment in management capacity has to go hand-in-hand with improved policies and policy processes.

5.2.2. Accelerating the growth of aquaculture

Globally, aquaculture is the fastest growing food production sector, contributing over 33 percent to the world's fish supplies. It is expected that by 2020 aquaculture will generate 41 percent of total fish supplies. Given this momentum at global level, why has Africa lagged behind? Looking at examples of rapid aquaculture growth, particularly in Asia, the following elements have been critical for success: (i) a well developed, widely shared strategy; (ii) harnessing the dynamic of effective public-private sector partnerships;

(iii) well developed economic profiling; (iv) sound perspectives on markets, product quality and market development; (v) target-driven research and development partnerships; (vi) piloting resource, institutional, and technical developments; and (vii) a continued process for developing policy and institutions. These factors need to be addressed. A phased approach is necessary, starting with investment in priority zones of current innovation and growth, where gains can be realized in the short term. Subsequently, these benefits can be transferred more widely throughout the region.

5.2.3. Responding to expanding markets and trends

Trade has always been essential to fisheries development. It is estimated that more than 40 percent of all fish harvested globally cross an international border between the point of production and the place of consumption. As trade and market conditions develop, the sector needs to respond in a way that maximises benefits according to development targets. In Africa, two dimensions of trade are critical at this stage: (i) increased integration of African fish supply chains into global markets; and (ii) growing demand in intraregional and urban markets across the continent. Both have fundamental implications for the future of fish production and utilisation and for sector development and governance more generally.

Table 12 shows the growing importance of foreign trade for fish supply in Africa. Within 30 years, the ratio of externally traded fish (imports and exports) to overall fish production has increased from 17 percent (1969) to 47 percent (1999). The data probably underestimate the mainly unrecorded informal trade of fish and fish products between African countries, so that the actual role of trade in meeting food security and economic growth objectives is likely to be even greater.

World trade in fish products has increased substantially over the past two decades. In 2001, African fish exports were valued at US\$2.7 billion, corresponding to about 5 percent of the total value of world fish trade. Much more can be done to foster markets for African fish products, both within the region and globally. In several countries, fish exports to European and other overseas markets are now contributing significantly to national economies. In a relatively short time, the fish processing and exporting industry has acquired access to tightly regulated markets by meeting international Hazard Analysis Critical Control Point (HACCP) and Sanitation Performance Standards (SPS). There is great potential to learn from these success stories and build the capacity of a wider spectrum of small and medium-sized enterprises to participate in these growth opportunities. At the same time, trade relations with importing countries need to develop further to stimulate the growth of value-adding industries in Africa. In marine fisheries, arrangements that regulate the access of foreign

fleets to African fish stocks need to be considered from a long-term perspective on fish supply and economic development opportunities.

5.2.4. Engaging the small-scale sector for growing value and benefits

African fisheries and aquaculture are characterised by the preponderance of the small-scale sector. The key challenge is to support the growth potential of this sector in the context of decentralization and 'co-management' approaches, as recent policy and legal reforms have opened up opportunities for communities to take more active part in the management of fisheries and aquaculture resources. This legal empowerment now needs to be accompanied by an economic empowerment in order to lead to positive development outcomes. What is needed at this stage, are strategic investments in infrastructure along the supply chain, targeted specifically at small and medium scale enterprises, together with financial services and business development support. Ample scope for enterprise development exists in production, processing, and marketing of fish, as well as in service sectors, including transport, input manufacturing and marketing, advisory services and information management.

5.3. A vision for African fisheries and aquaculture

Fisheries and aquaculture have the potential to contribute significantly to the socio-economic development of the continent. Their success, however, will depend on the adoption of an integrated, structured and targeted approach to sector investment that makes use of the comparative strengths of all stakeholder groups and pursues well-defined and agreed development goals. NEPAD's fisheries development programme has the overall purpose to increase and sustain the contribution of fisheries and aquaculture to Africa's socio-economic development and food security by: (i) sustaining, and where possible increasing, the long-term productivity of African fisheries and aquaculture through sustainable use of aquatic resources and application of environmentally sound technologies; and (ii) strengthening the food security and trade benefits for Africa's socio-economic development through improved access of African fish products to domestic, regional and international markets.

5.3.1. Fisheries and aquaculture and NEPAD's strategic objectives

Through its agricultural programme, NEPAD is pursuing an integrated set of objectives to utilise the rich agricultural resources of the continent for social and economic development. In many countries, and for millions of people, fisheries and aquaculture are an essential part of the food

producing sector. The aquatic food sector offers strategic opportunities for investment towards achieving the objectives of the CAADP as well as of NEPAD's Market Access Initiative and Environment Action Plan. Table 13 summarises the current and potential future contribution of inland fisheries, coastal and marine fisheries, and aquaculture to the strategic objectives of these NEPAD programmes.

The fishery sector thus makes contributions across all main elements of the CAADP and other NEPAD programmes. Its particular value lies in tying into the main framework the aquatic environment and the economy and food supply chains depending on it. The NEPAD perspective on fisheries and aquaculture thus integrates this sector into its wider socio-economic development framework, emphasizing benefits to stakeholders in Africa through increased productivity, commerce, food security, and improved environmental management.

5.3.2. Scenarios for the future of the fisheries subsector

The following section describes in more detail the NEPAD vision of what the sector could be in future, how its wealth can be sustained and further increased, and how it could deliver development benefits. It is presented as scenarios of desired outcomes in the immediate, short and medium-term future. These scenarios are structured around six key areas, identified in extensive consultations in the region, where progress needs to be made if goals are to be achieved. These areas are: (i) human and institutional capacity; (ii) management tools and implementation; (iii) sustaining and increasing production; (iv) developing and adding value; (v) sharing benefits; and (vi) learning and exchanging knowledge. These areas are considered over a timeline, i.e. periods of 1.5 and 15 years for which sector development objectives and targets can be defined. The main features of these time periods are:

- *Year 1:* defines the establishment of an effective programme, building working partnerships, setting baselines and defining process and monitoring rules. Areas for fast-track action are being addressed.
- *Year 5:* the main directions of the programme are made operational, policy developments and investment plans deliver results across a range of areas, and ways are confirmed in which benefits can be widened and strengthened.
- *Year 15:* longer-term aims are being achieved; new risk factors and external changes are accommodated in this period to establish sustainability and resilience of new sector developments.⁵

⁵ These time periods can be further developed at subregional, national or subsector levels, and can be adopted for key fisheries, resource systems or supply chains.

Starting with the objective of the NEPAD fishery programme, Table 14 describes for each of the key result areas the current status and desired outcomes over the three time periods.

5.3.3. The role of NEPAD in implementing the Fishery Programme

National governments, as well as Regional Economic Communities (RECs), have invested considerable resources into sector support programmes and a multitude of on-going initiatives where lines of accountability are clearly defined within national and subregional systems. NEPAD's role is to support and add value to these programmes, not least by providing continent-wide coordination, exchange, learning and capacity building mechanisms. As indicated in the table below, a three-tiered model is provided to outline NEPAD's roles in implementing the fishery programme.

National and local agencies may not always have the resources available to respond to needs and opportunities arising from the sector's dynamic environment – such as international treaties, export market demands and standards, governance and poverty reduction issues. In such cases, category three issues may well need to be addressed in partnership with RECs, NEPAD and international partners. This, however, does not remove the imperative to shift engagement to lower levels where at all possible.

5.4. Investment approaches and categories

In order to attract and guide further investments in the sector, catalytic opportunities must be seized. Investments into implementation of the NEPAD Action Plan or programmes by RECs could stimulate and guide larger investments at national level. It is also critical that public sector investments

are carefully targeted and structured in order to trigger a wider flow of private sector investments at all levels, from industrial to small-scale. Similarly, links need to be established outside the fishery sector, such as in trade and commerce, to create additional investment incentives. The following types of investment are likely to be important as indicated in the table on the right hand (page 33).

5.5. Priority areas for investment

Through extensive regional consultations, a number of priority interventions and action points have been identified in the three subsectors and in each of the CAADP pillars; these are described in detail in the *NEPAD Action Plan for the Development of African Fisheries and Aquaculture* (2005). In this section, these priority areas are grouped under the key result areas, and investment categories, and indicative resource requirements are described for each group over the 1-, 5- and 15- year horizons. These are based on global estimates and typical situations, and can only serve as an indication of what is required to move a diverse and dynamic sector forward. Much greater elaboration of individual components, cases and processes is necessary to arrive at detailed investment plans at various levels of government and enterprise. To facilitate the development of such plans will, in fact, be a first priority in the NEPAD programme.

5.5.1. Human and institutional capacity

Priority investment areas:

- establish structures, networks and processes at national, local and regional levels for improved sector management and accountable governance, with clear public, private and civil society sector roles;

Role of NEPAD in Implementing the Fishery Programme		
Category	Themes	Implications
1. Areas where NEPAD is uniquely responsible and competent.	Intergovernmental treaties; global trade representations of continental importance; representation in global economic fora; cross-sectoral or cross-functional regional interactions; up-stream research and training capacity through centers of excellence; political support for sector reforms.	A limited number of specialized functions apply at this level; NEPAD will have to draw on specific programme resources to carry out many of these functions; interaction with subregional and national agencies is essential for efficiency and justification.
2. Areas where NEPAD has a significant exchange, brokering and guidance role.	Developing and communicating regional perspectives on resources, development, economic indicators; identifying common interests, organizing research and development initiatives, promoting and co-ordinating capacity building, developing and promoting best practice approaches in policy, implementation, management, technical application.	Functions with a clearly recognized role for NEPAD; close co-ordination with the role of RECs; mainly supported through specific programmes and initiatives in response to external or sector-inherent factors. Longer term goal may be to move capacity to lower levels, allowing continued flexibility for NEPAD responses.
3. Areas where NEPAD has no specific place; responsibilities and capacity resides elsewhere.	Management, investment and capacity building at local, national and subregional levels; bilateral and REC interactions on resource access, trade, and investment; local, national and subregional monitoring, policy negotiations, planning and accountability.	May only have relevance where category (2) actions can support lower level functions – needs good communication to convey needs and responses, and good channels of capacity building to support subsidiarity.

Investment categories and sources			
Category	Typical applications	Financial instruments	Allocation criteria
Public goods investment	Policy, legal system, sector management, monitoring and control, research and knowledge development.	National revenue budgets, foreign direct budgetary support, external technical assistance.	National policy, budget reviews, programme proposals.
Infrastructure development - physical - capacity building	Transport, services, port and harbour, research and demonstration centres, training, skill development.	National capital and revenue budgets; public sector borrowing, multilateral loans, private finance initiatives.	Wider sector arguments, national policy targets, comparative returns.
Commercial investment - small-scale - large-scale	Physical capacity and working capital for production: vessels, gear, aquaculture facilities, processing plant; market development; services: monitoring, health management, advisory.	Small-scale: micro-finance, credit unions, own capital. Large scale: equity, banks and venture capital Both supported by national or international finance; small-scale also by development grants, etc.	Subject to governing rules of primary lenders, by security, returns, proposal quality; some funds may be earmarked for specific initiatives.
Social investment	Promotion and support of civil society "third-sector" agencies, in turn promoting social development agendas.	National budgets, international funds, NGO/charity fund-raising; donations.	Emergency issues; appeal of social concerns, potential to show impacts.

- build capacity among planners and managers for improved investment planning, applying comprehensive economic value approaches;
- improve policy and legal frameworks to increase development benefits from fisheries to African societies, including a review of fiscal frameworks, international trade agreements and foreign fleet access agreements;
- promote producer organisations, including for small- and medium-scale enterprises, and facilitate their access to financial services, skills and infrastructure;
- develop integrated public/private investment approaches;

major fisheries, integrating local, national and ecosystem wide agencies;

- develop and apply a coherent framework of fiscal policies and instruments for managing the sector;
- strengthen capacity across the spectrum of stakeholders to carry out management functions in the aquaculture sector;
- identify situations where reduction of fishing effort is required, and develop and apply effective strategies that are socially and economically viable; and
- define and apply best practice in delivering sector management functions, i.e. productivity, resource quality, stakeholder participation, efficiency, economic output.

Estimated resource requirements (US\$ million)				
Investment area	1-year period	5-year period	15-year period	Average annual
Human and institutional capacity	700	2 600	3 700	308

Estimated resource requirements (US\$ million)				
Investment area	1-year period	5-year period	15-year period	Average annual
Management tool and implementation	490	2 450	4 900	408

- Improve integration of fisheries investments and returns into national accounts and planning processes at all levels of government; and
- build technical and managerial capacity of a diversified service sector.

5.5.2. Management tools and implementation

Priority investment areas:

- develop and apply practical approaches to eco-system based collaborative fisheries management in all major fisheries in inland and marine environments;
- strengthen capacity of key stakeholder groups to develop and implement management plans in all

5.5.3. Sustaining and increasing production

Priority investment areas:

- improve capacity for sustained and improved capture fisheries through investments in management, governance, infrastructure, technologies within agreed fisheries management plans;
- identify and promote opportunities for fisheries enhancements;
- accelerate growth of aquaculture in artisanal as well as large commercial sectors, applying a phased approach that starts with priority zones of current growth and innovation;

- create a positive investment environment for private sector investors from micro to large commercial scale; and
- establish benchmarks, standards and protocols for increased and sustained production in all major fisheries and aquaculture zones.
- strengthen capacity of small-scale enterprises and women entrepreneurs to participate in expanding commercial opportunities in the sector;
- enhance the participation of civil society organizations in governance and management processes; and

Estimated resource requirements (US\$ million)				
Investment area	1-year period	5-year period	15-year period	Average annual
Sustaining and increasing production	300	4 100	11 300	942

5.5.4. Developing and adding value

Priority investment areas:

- improve understanding of total economic value of fisheries and aquaculture and implement coherent investment planning across relevant sectors;
- reduce losses of economic and nutritional value of fish products at post-harvest stage through investment in landing site and transport infrastructure, enterprise development, policies and standards, and technologies;
- strengthen trade policies, regulations and quality standards to encourage enhanced trade of fish products to a range of consumers, in domestic, regional and international markets;
- increase value of fish products and supply chains through investments in value-addition industries, infrastructure and service sector; and
- develop effective public/private partnerships for investment in market development for African fish products in the region and internationally.

Estimated resource requirements (US\$ million)				
Investment area	1-year period	5-year period	15-year period	Average annual
Developing and adding value	200	2600	7 400	617

5.5.5. Sharing benefits

Priority investment areas:

- develop and apply practical approaches to securing access of the poor to sector resources and services, including rights-based access regimes, legal services and increased accountability of institutions at local to national levels;
- strengthen integration of fisheries and aquaculture into food security initiatives in the region, including school feeding programmes and rural development programmes in food and water insecure regions;

Estimated resource requirements (US\$ million)				
Investment area	1-year period	5-year period	15-year period	Average annual
Sharing benefits	500	3 300	5 800	483

- improve understanding of ultimate human development benefits of fisheries and aquaculture development, and develop and implement investment programmes that target vulnerable populations.

5.5.6. Learning and exchanging knowledge

Priority investment areas:

- improve flow of information and best practice lessons across the sector and between stakeholder groups at local to regional level;
- implement fast-track programmes for transfer and adaptation of existing knowledge and technologies from several sectors and regions for immediate impact;
- establish knowledge and learning environment, with clear processes and indicators to monitor performance of sector investments and their socio-economic and environmental implications; and
- strengthen capacity for research and knowledge application in the region in key areas affecting the long-term sustainability of sector growth, including productivity, resource integrity, water management, technologies, climate change, markets, and governance.

Estimated resource requirements (US\$ million)				
Investment area	1-year period	5-year period	15-year period	Average annual
Learning and exchanging knowledge	200	1 400	2 200	183

5.6. Summary of resource requirements and types of investment

Total resource requirements amount to US\$35.3 billion over a 15-year period or close to US\$2.4 billion annually. Slightly more than half of this amount, US\$1.246 billion would be targeted directly at the product chain (“production” and “value” components) and would come mainly from private sector investors. Public goods investment

will focus on policy and institutional changes across the sector components in order to attract and guide larger investments by private sector and “third sector” agencies.

Summary of investment needs over 15-year timeline				
Component	<i>US\$ million</i>			
	1-year period	5-year period	15-year period	Average annual
Human and institutional capacity	700	2 600	3 700	247
Management tool and implementation	490	2 450	4 900	327
Sustaining and increasing production	300	4 100	11 300	753
Developing and adding value	200	2 600	7 400	493
Sharing benefits	500	3 300	5 800	387
Learning and exchanging knowledge	200	1 400	2 200	147
TOTAL	2 390	16 450	35 300	2 354

