FAO SmartFish
Publication 14

Secure Fisheries
Secure Futures

FLAVOURING FISH INTO FOOD SECURITY

John Kurien
Javier López Ríos

INDIAN OCEAN
COMMISSION

Cover photograph courtesy of FAO, Davide Signa

REPORT/RAPPORT: SF-FAO/2013/14

Flavouring fish into Food security

A Preliminary Assessment of the Integration
of Fisheries and Aquaculture into
Food and Nutrition Policy Frameworks
of East and South Africa and Indian Ocean Countries

August 2013

GCP/RAF/466/EC SmartFish Project

Kurien, John & López Ríos, Javier 2013. Flavouring fish into food security. Report/Rapport: SF-FAO/2013/14. August/Aout 2013. FAO-SmartFish Programme of the Indian Ocean Commission, Ebene, Mauritius.

Acknowledgements

We are grateful to the following officers from the East and South Africa and Indian Ocean (ESA-IO) region for taking time out to fill in the questionnaires sent to them. They have made this study more participatory:

Evariste Rumbete; Joseph Ndikumana; Said Boina; Koffi Mulumba; Mahamoud Youssoul; Ahmed Darar Djibril; Tsion Dveje; Brook Lema; Hussein Abegaz; Lucy Obungu; Samueline Vololoherimandimby Ranaivoson; Tantely Harimanana Razafindrajery; Moffat Mzama Manase; Orton M. Kachinjika; Daroomalingum Mauree; Jean Claude Ndorimana; Finley Racombo; Abdiwali Nur Farah Fagalah; Suzana Gabriel; Aloma Francis Sarafino; Nadia Eldindring Omar Karoum; Julius P. Mairi; Kabuye Geoffrey; Bukirwa Faridah; Harris Phiri; Bothwell Mkodza; Tecle Alemseghed Desta.

Additionally, the authors would like to thank Ms Josefine Gesien for her help in collecting the policy papers for the countries and the Regional Economic Communities (RECs) involved, and the FAO staff Ms Helga Josupeit, Mr John Ryder and Mr Davide Signa, for their feedback and assistance.

Executive Summary

This study makes a preliminary assessment of fisheries and aquaculture incorporation into the food and nutrition policy frameworks of twenty countries in the East and South Africa and Indian Ocean (ESA-IO) region.

In a world where we are confronted with the paradox of hunger, food resources such as fish, which are readily available in the ESA-IO countries, can become an important part of the solution to food and nutritional insecurity that plagues the sub-Saharan countries as a whole and the ESA-IO region in particular. The vast aquatic resources – in the sea, rivers, lakes and man-made water bodies - of the region provide the basis for supporting vibrant small-scale fishery activities. Development inputs dedicated to these activities can, in turn, increase the purchasing power of fishers and fish workers and also make fish available at reasonable prices to needy rural consumers.

Policy making for food security presupposes that the formulators have a good understanding of all the food sectors of the economy and the inter-relations that exist between them. In this study, we first assessed the extent to which fish and fisheries have been integrated into food security related, as well as economic and social development, policy documents. This assessment was followed-up by using fishery related indicators to consider the extent to which fish and fisheries are integrated into the diets and economies of the 20 ESA-IO countries. The extent of congruence or mismatch between integration by word (incorporation into policy) and integration by deed (the reality of food and the economy) was examined.

Fishery officers, who are the key link between high level policy makers and people in the fisheries sector, play a crucial role in translating policy into action. Consequently, their understanding of the various factors that have a bearing on the role of fish and fisheries in food and nutritional security is paramount. An assessment of the knowledge of these officers and their creative suggestions on what is to be done to improve integration was carried out and highlighted their potential as policy makers.

There is not an iota of doubt that enhancing the integration of fish into the diets and fisheries into the economic activities of countries will raise the well-being of all. Using a menu of indicators, we arrived at a gradated list of countries with different levels of potential for enhancing integration. It should be noted that by using this approach, we run the risk of betting on the strong and neglecting the weak. This prompted us to embark on an exercise to identify countries where there is a real need and, within this category, where it would be possible to raise a real awareness among the population about this need. The resulting list of countries includes: Kenya, Malawi, Rwanda, Tanzania, Zambia and Zimbabwe. These countries straddle the spectrum of nations with high, medium and low potentials for enhancing the integration of fish and fisheries into their food intake and economic activities.

The analysis of the Regional Economic Communities indicates that much needs to be done to make their policy orientation process recognise more cogently the role that fish and fisheries play in the economic activities and dietary habits of the citizens. In particular, the East Africa Community, the Common Market for Eastern and Southern Africa ESA-IO and the Indian Ocean Commission perform badly when comparing the importance of fisheries in their region with the presence of fisheries issues in their policy papers.

The final chapter of this study provides an assessment of the degree of integration in word and deed, of seven countries namely: Comoros, Djibouti, Malawi, Rwanda, Burundi, the Democratic Republic of Congo and Zambia. Fish was identified as important in these countries but this fact is presently overlooked in policy discussions. Integrating these countries with those identified above as having potential for increased fish consumption, we are left with a final list of five countries where SmartFish could start advocacy work: Comoros, Djibouti, Malawi, Rwanda, and Zambia. Furthermore, Mauritius should also be included as another country where actions should be implemented by SmartFish, given the high potential and low inclusion of this subject in current policies in this country.

This is the challenge of flavouring fish into food security.

Résumé exécutif

Cette étude est une évaluation préliminaire des composantes pêche et aquaculture dans les politiques alimentaire et nutritionnelle des vingt pays de la région Afrique orientale et australe et océan Indien (AfOA-OI).

Dans le monde actuel confronté au paradoxe de la faim, les ressources alimentaires telles que le poisson, facilement accessibles dans les pays de la région, peuvent contribuer de manière significative à solutionner l'insécurité alimentaire des pays d'Afrique sub-saharienne dans leur ensemble et ceux de la région AfOA-OI en particulier. Les ressources aquatiques de la région – issues des rivières, mers, lacs et plans d'eau – sont un support de base à la pêche à petite échelle. Le développement d'intrants dédiés à ces activités peut améliorer le pouvoir d'achat des pêcheurs et des travailleurs de la pêche, et également rendre le poisson plus accessible pour les consommateurs ruraux.

L'élaboration des politiques de sécurité alimentaire suppose que les législateurs aient une bonne compréhension des secteurs de l'économie et de leurs interrelations. Cette étude a premièrement évalué l'étendue de l'intégration de la pêche dans les politiques de sécurité alimentaire et les politiques de développement économique et social. Cette évaluation a été réalisée en examinant l'intégration d'indicateurs « pêche » dans le régime et dans l'économie des 20 pays de la région AfOA-OI. L'importance des convergences ou disparités entre l'intégration par les mots (dans les textes de lois) et dans les faits (l'alimentation et l'économie) a été examinée.

Les officiers des pêches, qui sont le lien entre les décideurs politiques et les travailleurs du secteur de la pêche, jouent un rôle crucial en mettant en œuvre les politiques. L'analyse qu'ils font des éléments susceptibles d'influencer le rôle de la pêche dans la sécurité alimentaire et nutritionnelle est donc extrêmement importante. Une évaluation des connaissances de ces officiers et de leurs suggestions afin d'améliorer l'intégration de la pêche a été réalisée. Leur potentiel en tant que législateurs a été mis en avant.

Il ne fait aucun doute que favoriser l'intégration de la pêche dans les régimes alimentaires et les activités économique élèvera le niveau de vie de tous. Grâce à l'utilisation d'indicateurs, nous sommes parvenus à classer les pays selon leur degré potentiel d'intégration de la pêche. Il faut noter qu'en utilisant cette approche, il existe un risque de négliger les faiblesses tout en favorisant les forces. Cela nous a mené à faire un exercice d'identification des pays où il existe un besoin réel et, dans cette catégorie, d'identifier où il serait possible de sensibiliser réellement la population à ce besoin. Le résultat est : le Kenya, le Malawi, le Rwanda, la Tanzanie, la Zambie et le Zimbabwe. Ces pays font partie des Nations avec un haut, moyen et bas potentiel pour améliorer l'intégration de la pêche au sein de leurs apports alimentaires et activités économiques.

L'analyse des Communautés économiques régionales indique qu'il reste beaucoup à faire pour que le processus politique s'oriente vers plus de reconnaissance du rôle de la pêche dans l'activité économique et les habitudes alimentaires des citoyens.

En particulier, la Communauté de l'Afrique de l'Est, le Marché commun de l'Afrique orientale et australe et la Commission de l'océan Indien réalisent de mauvaises performances quant à l'intégration de la pêche dans les textes de loi dans leur région respective.

Le dernier chapitre de cette étude contient une évaluation du degré d'intégration, dans la loi et dans les faits, des sept pays suivants : Union des Comores, Djibouti, Malawi, Rwanda, Burundi, République Démocratique du Congo et Zambie. La pêche a été identifiée comme étant importante dans ces pays mais on ce fait a tendance à être oublié dans les discussions politiques. Ces pays ont donc été ajoutés à la liste de ceux avec un potentiel d'augmentation de la consommation du poisson. Il en reste donc cinq dans lesquels SmartFish pourrait commencer un travail de sensibilisation : Union des Comores, Djibouti, Malawi, Rwanda et Zambie. De plus, Maurice devrait également être inclus comme pays où SmartFish pourrait mettre en œuvre ses actions car il y existe un potentiel important et une faible intégration du sujet dans les politiques du pays.

C'est le challenge de mettre la pêche au goût du jour de la sécurité alimentaire.

Contents

List of Tables

Acronyms and abbreviations

AU	African Union
CAADP	Comprehensive Africa Agriculture Development Programme
CNPMT	Cadre Nationaldes Priorités à Moyen Terme
CPF	Cadre de Programmation FAO
COMESA	Common Market for Eastern and Sothern Africa
CSSF	Country Support Strategic Framework
DES	Dietary Energy Supply
EAC	East African Community
EEZ	Exclusive Economic Zone
EPR	Emergency Preparedness and Response
ESA	East and Southern Africa
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
IGAD	Inter-Governmental Authority for Development
IO	Indian Ocean
IOC	Indian Ocean Commission
IUU	Illegal, Unreported and Unregulated
LGA	Local Government Area
MCS	Monitoring, Control and Surveillance
NEPAD	New Economic Partnership for African Development
NFP	National Fisheries Policy
NFSAP	National Food Security Action Plan
NGO	Non-Governmental Organization
NMTPF	*National Stratégique des Priorités d'Intervention à Moyen Terme de la FAO au Burundi*
PAF	Partnership for African Fisheries
PASP	Plan d'Action dans le Secteur Primaire
PIF	Policy Investment Framework
PNSA	Programme National de Securité Alimentaire
PoA	Plan of Action for North Sudan
PPP	Purchasing Power Parity
REC	Regional Economic Community
RFB	Regional Fisheries Bodies
SADC	Southern African Development Commission
SNDP	Sixth National Development Plan
SPTA	Strategic Plan for the Transformation of Agriculture
TAFSIP	Tanzania Agriculture and Food Security Investment Plan
UNDAF	United Nations Development Assistance Framework
WFP	World Food Programme

1. Introduction

".....fish should be regarded as one of the most important sources of food in any program for raising the nutritional levels of peoples throughout the world"

FAO. 1945. Five technical reports on food and agriculture: Fisheries. Report of the Technical Committee on Fisheries, submitted to the United Nations Interim Commission on Food and Agriculture. Washington. pp. 175–216.

The most pressing economic, social, cultural and ethical problem, which the world faces today is one of the oldest and most tenacious: hunger. Hunger still persists at a time when there is more food available in the world than ever before.

Almost a billion people do not have enough to eat. They live in uncertainty as to where their next meal will come from. They are both under-nourished and malnourished from not having enough food and from not having food with the right nutrients. The majority of these people live on the South-Asian sub-continent and in sub-Saharan Africa.

Hunger is not just a problem for developing countries. The USA and several European countries are currently spending money on food stamps and operating food banks to help feed increasing numbers of poor and marginalised people.

The cruel paradox is that another billion people have to come to terms with the opposite problem – obesity; they eat too much. However, they too are malnourished from excessive consumption of poor quality foods. Most of these people live in developed countries, but an increasing share can now also be found in urban areas of developing countries.

An argument put forward by many was that hunger would disappear once economic growth in developing countries increased. If this were true, then indeed most countries of South Asia and sub-Saharan Africa would be free from hunger. These countries have been able to achieve respectable growth rates in terms of their gross domestic products (GDP) over the last decade, even during the ongoing uncertainties of the global economy. However hunger and food insecurity persists – and is even on the increase. While food is rotting in warehouses, people around the world, who are often food producers themselves, are going hungry.

1.1 Why hunger amidst plenty?

Several reasons have been put forward for this phenomenon of hunger and food insecurity amidst plenty. The most important of these are the persistent poverty of millions of people in rural and urban areas and the rising prices of food commodities at the retail level. The issue is not the availability of food alone. The problem is the inability to muster the economic resources to access this food. Simply put, people may be poor because they have no source of income and therefore do not have the money to buy food.

Even when people can just about manage to buy food, their bodies may be unable to retain and convert it into useful energy due to poor health and/or illness. Much of this ill health is caused by the habitat and environment in which they live; often they are deprived of basic amenities such as clean water and sanitation. When people are ill their bodies are not able to absorb the necessary nutrients from the food they eat.

An additional reason for both under-nourishment and malnutrition can be attributed to the fact that people are not aware of the right food choices to make. Good nutritious and inexpensive foods may be available in their own neighbourhood/locality/country. However, people may be unaware of this, or they may be influenced to make the wrong choices and access foods that are not nutritious.

1.2 Food insecurity in Africa

There is no life without food and there is no human development without food security. The prevalence of hunger is highest in sub-Saharan Africa. One in every four Africans is under-nourished. In 2008, the count was 218 million. Hunger and malnourishment attack the very foundation of human development. Food security and human development are therefore mutually reinforcing.

FAO defines food security as "a condition when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life". There are two ways to achieve food security. The first is to make food directly available to those in need. The second is to provide employment opportunities to people so that they can earn an income and use it to buy food of their choice.

In Africa, and particularly in sub-Saharan Africa, both direct and indirect approaches to achieving food security are at risk in most of the countries. Despite moderate economic growth – measured conventionally as the percentage rate of increase in real GDP – the level of food production has not increased substantially and poverty in the population has not declined significantly. The nutrition outcomes have been inadequate and malnutrition continues to plague the region's population – particularly its children and thus its future. Along with malnutrition, there is also pervasive 'hidden hunger' in the form of micro-nutrient deficiencies which are rampant in the East and Southern African (ESA) countries and sub-Saharan Africa as a whole.

Food insecurity thus continues to be a stark reality in sub-Saharan Africa. Food insecure people are less healthy and become economically unproductive. This leads to lower income-earning possibilities. Food insecure people also tend to have lower educational achievements. Taken together, these factors account for the low human development of the people in the region. Enhancing food security is thus the only sustainable route to achieving wholesome human development. Higher human development in turn ensures greater food security thus creating a virtuous cycle.

Incorporating and integrating food security – its direct and indirect methods of achievement – into plans and policy making processes and making them a reality on the ground in countries of the region, is of great importance. Such exercises must be country specific particularly with respect to the kind of food commodities that are included in the food security basket. Food choices are greatly influenced by particular elements of the ecosystem e.g. the kind of land and water sources that are available; but they are also socially and culturally conditioned.

Discussions, debates and policy-making processes, with regard to food security in Africa (and in other parts of the world), are centred on cereals, pulses and meats. Food policy is largely terrestrial oriented. Little is said about fish, even in countries where fish is central to the population's diet, irrespective of income levels and social status. This is unfortunate to say the least. The pivotal role that fish can play in direct food security is not adequately recognised, it only appears to find its place on the periphery of policy makers' concerns. In fact it could even be considered as a 'policy blind spot'.

1.3 Fish and fisheries for food security

In the context of hunger and obesity, the role of fish as a wholesome and inexpensive food source for achieving food security merits serious consideration.

Many of the discussions and reports on food security focus on terrestrial foods. This is primarily due to the fact that they account for a larger proportion of the calories needed for daily human consumption.

Humans cannot live on fish alone, however small quantities of fish in human diets can make crucial differences in brain development; are beneficial for the development of bone and muscle tissue; can prevent blindness, heart attacks and cancer; as well as mitigate the effects of HIV/AIDS.

Where there are aquatic resources, fish can be found naturally. In rivers, lakes, ponds, reservoirs, floodplains, coastal waters and the open sea, fish as well as other edible aquatic organisms and plants, are in plentiful supply. Fish can also be easily cultured in different aquatic milieu.

Sub-Saharan countries are blessed with a large share of such aquatic resources, making the potential for fisheries development a natural choice. With small, dedicated and 'quality-investments' of time and money, returns, in the form of fish can be substantial. Thus, contrary to popular belief, the potential for growing and harvesting fish in sub-Saharan Africa, for a direct contribution to increased food supply and food security, is considerable.

In this context, it is important to highlight that fish is not a homogenous product. Species diversity, and consequently physical form, is vast and manifold.

Substituting meat with fish is therefore not always easy. Tastes are culturally acquired and require time to adjust. Palates are more easily adaptable if one starts young, therefore the introduction of fish into school feeding programmes could prove to be the means to promote fish consumption for future generations.

1.4 Role of policy

Policies are principles or guidelines, which provide direction for decision-making. Good policies can provide a sound basis for enlightened actions and a 'vision' which will help formulate food and nutritional strategies to assess needs, identify potentials and assist in linking and integrating potential needs. Good policy making, however, is a process not a one-time event of drafting of good intentions. It presupposes adequate knowledge of the realities on the ground. It requires hard facts and data, and their appropriate juxtaposition, to give rise to sound information based on which guidelines can be formulated and decisions taken. Policy making for food security presupposes that the initiators have a good understanding of all the food sectors of the economy and the inter-relations that exist between them.

Involving personnel, such as government executives who are responsible for implementing the policy, is important to ensure that policy formulation is participatory. Consultations, or prior public hearings, with various stakeholders from the sector, allow for the creation of a realistic and inclusive policy. Balanced gender representation provides the much-needed 'household-level view' of food security that women alone provide with greater empathy and authority.

1.5 Focus of this study

This study is part of the European Union funded SmartFish Program financed under the 10th European Development Fund. The Program aims to contribute to an increased level of social, economic and environmental development and deeper regional integration in the Eastern-Southern Africa and Indian Ocean Region (ESA-IO) through improved capacities for the sustainable exploitation of fisheries resources. The Program focuses on five components: (1) Fisheries Management; (2) Governance; (3) Effective Monitoring Control and Surveillance; (4) Trade; and (5) Food Security.

This study is part of component 5, which focuses on food security. The emphasis of component 5 is on making a preliminary assessment of the level and nature of fisheries and aquaculture integration both regionally and nationally in food security, nutrition policies, plans and strategies. Twenty countries were included in the assessment, see Map 1. below.

Map 1. Countries selected for the study in the ESA-IO region

This study is divided into three parts:

The first part of this study (Chapter 2) evaluates the levels of awareness of fishery officers in these countries on understanding the role of integrating fish and fisheries into food security. This was achieved through a questionnaire, which assessed their understanding and was used to elicit their opinions and suggestions on the topic. These officers, key links between top policy makers and the population, are indispensable agents in promoting the integration process. Their structured involvement in any policy making process is vital.

The second part of this study (Chapter 3) uses the quantitative data, which is available in the public domain, to make an informed analysis of enhancing integration by assessing potentials, needs and the scope for raising awareness in these countries with respect to factoring fish and fisheries into their food and nutritional security scenarios.

The principal part of this study (Chapter 4) deals with assessing the integration of fish and fisheries into policies and plans of 20 countries of the ESA-IO and in the regional organizations of the same region. This meant analysing the contents of about 100 documents, which pertain to policies on, *inter alia*, food security, food production, development assistance frameworks, water strategies, oceans and fisheries. Given the diverse nature of the countries involved – islands, coastal states, landlocked nations – and the different levels of economic activities in the fisheries sector, it is natural to expect variations in the levels of inclusion and integration of fisheries such policy documents. This final part of the study identifies those countries where fisheries play an important role in the national and regional economy, but are neglected in the policy discussion, especially when dealing with food security issues.

Annex 1 gives an indication of the participation of ESA-IO countries in the various RECs. Annex 2 gives some ideas on concrete actions for integrating fisheries and aquaculture into national and regional development work. Finally, Annex 3 discusses statistical data and policy papers for individual countries, and also includes an analysis of sets of countries in five different RECs.

Chapter 2 to Chapter 4 of this study are important for an understanding of the goal articulated in the FAO statement of 1945, quoted at the outset of this introduction:

"……. fish should be regarded as one of the most important sources of food in any program for raising the nutritional levels of peoples throughout the world."

1.6 Limitations of the study

This study should to be viewed as a very preliminary attempt to understand the domain of policy and real world praxis. Analysing documents for content is always subjective and time determinate. If another set of documents from a different period in time relating to the same set of countries is studied, the inferences could differ. The same could be said about the use of data sets. These caveats need to be kept in mind when reading the contents of this study. However, this study is a signpost at the start of a journey that points in the general direction to which further analysis may be undertaken.

2. Understanding integration: views of the fishery officers

One important element of this study was to involve the fishery officers from the 20 different countries. The aim was to assess their views, positions and suggestions with regard to enhancing the role of fisheries and aquaculture in the food and nutritional security of their respective countries and the ESA-IO region as a whole.

2.1 Factors and impacts

Preliminary efforts focused on having the officers assess those factors that have a bearing on the role of fish in food and nutritional security. They had to decide if the impact of a certain factor was favourable, adverse or of had no effect. We listed 18 factors that covered different aspects of the four pillars of food security as defined at the World Summit of Food Security in 2009 namely: availability, access (economic and physical), utilisation and stability.

The analysis shown in Table 1 below reveals that, taken collectively, the 27 participating officers have a good understanding of the impact of these factors on food security. There is still however, a lack of clarity and ambiguity. **General issues:** (Factors 13 - 16 in Table 1). It should be emphasized that improvements in access to clean water and sanitation will have a very positive bearing on food security, as will higher levels of female literacy. On the other hand, increased infant mortality - which is actually a good proxy indicator for improvement in water and sanitation conditions and also female literacy - will have the opposite effect. The high level of ambiguity which is displayed in the results thus points to a lacuna in the understanding and awareness of the officers concerning these very crucial dimensions of achieving food security.

Access: (Factors 8 - 12 in Table 1). Acess is a well-established factor that reflects per capita income. Price increases (rises in the consumer price index) will have an adverse impact on food security because people will have less money to buy (access) food. On the other hand, if there is a decrease in the number of people living below the poverty line, this implies, *inter alia*, an increase in income, a decrease in commodity prices, or both. The ambiguity which is displayed in the results indicates a lack of awareness on the part of the officers about this important aspect of achieving food security.

Availability (Factors 1 - 7 in Table 1). There is ambiguity with regard to the factor: "Increase in imports into the country of fish meant exclusively for domestic consumption". There may have been confusion between imports meant for processing and re-export, which is usually the case, and imports meant specifically to supply the domestic market.

Table 1: Fishery officers' awareness and understanding of the role of fisheries and aquaculture in food security

	Some of the factors that have a bearing on the role of fish in food and nutritional security	Favourable impact	Adverse impact	No impact	Total (%)
1	Increase in total fish production of the country (all water sources)	84	8	8	100
2	Decrease in the share of fish harvested by small-scale fishers in the country	0	78	22	100
3	Increase in small-scale aquaculture in the country	100	0	0	100
4	*Increase in imports of fish meant exclusively for domestic consumption*	*48*	*36*	*16*	*100*
5	Good market facilities in country for retail sales of fish	92	4	4	100
6	Availability of ice and cold storage facilities in country	92	4	4	100
7	Improvement in roads from coast to inland areas of the country	92	4	4	100
8	*Fall in the per-capita income of the population of the country*	*15*	*70*	*15*	*100*
9	*Rise in the general consumer price index in the country*	*19*	*73*	*8*	*100*
10	Increase in fish prices in the country	13	87	0	100
11	*Decrease in the number of people living below the poverty line in the country*	*76*	*12*	*12*	100
12	Increase in the employment levels in the country	92	0	8	100
13	*Improvement in the access to clean water in the country*	*77*	*0*	*23*	*100*
14	*Increase in infant mortality rate in the country*	*24*	*60*	*16*	*100*
15	*Improved access to sanitation in country*	*72*	*8*	*20*	*100*
16	*High level of female literacy in country*	*61*	*15*	*24*	*100*
17	Increase of information and education about role of fish in nutrition	92	4	4	100
18	Media campaigns in country on the benefits of fish consumption	88	4	8	100

Availability 1-7; Access 8-12; General information 13-18. Cells in italics are factors where results are ambiguous

2.2 Protein preferences

One of the significant constraints in enhancing the role of fisheries and aquaculture in food and nutritional security in the ESA-IO region pertains to strong culturally conditioned protein preferences for different types of meat in different countries. As a result, even if fishery resources were readily available, changing people's diet patterns to accommodate fish in their food preferences could be a herculean task.

The fishery officers were asked which animal protein was most preferred by consumers in their country. They were asked to rank the various animal proteins in order of preference.

Such exercises may be biased as the officers concerned may be expressing their own personal preferences rather than the overall preferences in the country at large. However, having indicated this possible response bias, it must also be stated that there cannot be a single 'objective set' of preference ranks for a country as a whole. This is because protein consumption is influenced by factors such as income, religion, location, etc.

With the above factors in mind, Table 2. gives an overview of the rankings of the protein preferences for the 20 countries.

Table 2: Protein preferences by country as indicated by the fishery officers

Country	First	Second	Third	Fourth	Fifth	Sixth
Burundi	Beef	**Fish (20)**	Other	Chicken	Pork	Mutton
Comoros	**Fish (30)**	Chicken	Beef	Mutton		
Democratic Republic of Congo	**Fish (40)**	Chicken	Beef	Pork		
Djibouti	Mutton	Beef	**Fish (34)**	Chicken	Pork	
Eritrea	Beef	**Fish (3)**				
Ethiopia	Beef	Chicken	Mutton	**Fish (1)**	Pork	
Kenya	Beef	Chicken	**Fish (6)**			
Madagascar	Pork	**Fish (17)**	Chicken	Beef	Turkey	Mutton
Malawi	**Fish (28)**	Chicken	Beef	Pork	Goat	Mutton
Mauritius	Chicken	**Fish (17)**	Beef	Mutton	Pork	
Rwanda	Chicken	**Fish (12)**	Beef	Mutton	Pork	
Seychelles	**Fish (47)**	Chicken	Pork	Beef	Mutton	
Somalia	Beef	Chicken	**Fish**			
South Sudan	**Fish**	Chicken	Beef	Mutton	Pork	Goat
Sudan	Beef	Mutton	Chicken	**Fish (2)**		
Swaziland						
Tanzania	Beef	**Fish (21)**	Chicken	Mutton	Pork	
Uganda	Chicken	**Fish (33)**	Beef	Pork	Mutton	
Zambia	Chicken	**Fish (25)**	Beef	Pork	Mutton	
Zimbabwe	Beef	Chicken	Pork	**Fish (3)**	Mutton	

Source: Study Data. Figures in brackets indicate the share of fish in animal protein intake

2.3 What has to be done?

Having assessed their understanding of the different factors that have a bearing on the role of fish in food security and obtained information on protein preferences in their respective countries, we requested the officers to provide at least three suggestions on what needs to be done to increase the role of fisheries in the food and nutritional security in their respective countries.

A questionnaire was sent out to be completed by fishery officers of the 20 countries, 19 of which were returned completed. From countries such as Djibouti, Ethiopia and South Sudan, where fish is not the major source of protein a total of 7 responses were received. A total of 97 suggestions were analysed from the 19 countries. The responses were then categorised into the four pillars of food security: availability, access, utilisation and stability (see Table 3 below).

Table 3: Summary of opinions expressed by fishery officers on important factors that will help increase the role of fish in food and nutritional security

Food Security Dimension	Total number of opinions	Percentage of each dimension	Factors that will increase the role of fish in food and nutritional security
Availability (43)	11	26	Increase aquaculture production
	10	23	Increase capture from marine and inland sources
	10	23	Credit availability, equipment, training to enhance production
	6	14	Reduce post-harvest losses
	6	14	Improve resource management
Access (34)	20	59	Improve cold chain facilities, transportation facilities, communications, markets and roads
	7	20	Training and capacity building of all participants along the value chain
	4	12	Support small sellers to reach low income consumers
	3	9	Lower prices
Utilisation (14)	9	64	Educate about the general nutritional value of fish and its health impacts
	5	36	Specifically targeted awareness initiatives for mothers, youth and school children
Stability (6)	3	50	Hygiene for handling of the product
	3	50	Sanitary and hygienic conditions of the markets

The vast majority of the suggestions (80 percent) pertain to the dimensions of *availability* and *access* of food security. It was interesting to note, that none of the fishery officers suggested that improved policies were central to improved food security.

With regard to access, emphasis was more on physical aspects and less to do with economic aspects (price, income, costs etc.). The issue of *utilisation* also featured well (14 percent) in the listing. The least mentioned dimension was *stability*. Ambiguity regarding this matter was mentioned earlier (see Table 1 above). Considering that this dimension of food security has been inadequately highlighted in both literature and practice, the lack of suggestions under this category is hardly surprising.

Availability: Upon examination of the views expressed, it was noted that about half (49 percent) of them relate to the general consensus that the production of fish from marine, inland and aquaculture sources needs to be increased, with aquaculture the most frequently mentioned. One fifth of the views (23 percent) are more specific suggesting the means by which such an increase could be achieved: provision of credit, equipment (nets, boats, etc.) and capacity building training.

About one third (28 percent) of the opinions refer to actions to ensure the sustainable availability of fish in the present (by reducing post-harvest losses) and in the future (by improving resource management).

Access: Well over half (59 percent) of the suggestions focus on improving the physical access to fish through provision of cold storage facilities, better transportation and market facilities, improved communications and roads. One fifth of the views highlight the need for training and capacity building for those involved along the supply chain to improve quality and reduce fish losses. Only one-fifth of the respondents relate to the economic aspects of accessibility seen from the perspective of the consumers – reducing costs and lowering prices – so that fish becomes more affordable to poor and needier consumers.

Utilisation: The greater emphasis (64 percent) is on the need to educate consumers about the health and nutritional aspects of fish. A significant third of the views (36 percent) recognises the need to target mothers, children and youth so that a new generation of fish eaters can be created.

Stability, which is the Achilles heel in understanding food security, recorded the smallest number of views. Opinons reflect the need for hygienic handling of fish and improved sanitary and hygienic conditions in the markets. While these are certainly important features in ensuring greater utilisation of fish (or any food) by the body, the core consideration should be on the sanitary and hygienic conditions in which the consumers find themselves on a daily basis.

2.4 Merits of participation

On the whole, this participatory exercise with the fishery officers, who may also be important in influencing food security policies in their respective countries, point to both their reasonably good levels of awareness, as well as some "blind spots" in their understanding of the multi-dimensional factors which influence the role of fish in food and nutritional security.

It is in the interest of governments of the ESA-IO Region to enhance the capacity and capabilities of government officers in the Fisheries Departments to further the goal of increasing their country's food security. A well-informed cadre of officers needs to stress the importance of fish in food consumption. Equally, and perhaps more importantly, they need to highlight the crucial associated, enabling conditions which are needed to achieve this goal.

Many of these latter conditions are outside the realm of the Fisheries Departments. However, it is only when there is a collective and consorted effort by all, the food, nutrition, health, education, water supply and sanitation departments, that governments, and their top policy makers, will begin to perceive the logic for a more coordinated and multi-faceted approach to achieving food and nutritional security.

It seems likely that officers in the Fisheries Departments are not consulted during the formulation of policy regarding economic development and/or food and nutrition security. For if they were, then certainly the role of fisheries and aquaculture would have been more centrally integrated into the food and nutrition policies of many of the countries of the region. This lack of consultation has proven to be a great loss for policy making.

The participation of the officers in this manner enabled us to partly tap into the 'internal' views and knowledge of their respective governments on this subject. Additionally, it also provided us with information which would be hard to obtain from secondary sources. It also gave us the possibility to identify 'gaps' in their understanding and possibly recommend the kind of actions which could be taken to fill them. Many of the policy suggestions indicated by the fisheries officers have been integrated into the individual country policy briefs.

Equally important, is the fact that the results obtained reinforce the conviction that participation of the officers is a valuable process for integration.

3. Enhancing integration: potential, need and awareness

Assessing the levels of integration and understanding the processes of integration provides the background for probing into the possibilities for enhancing integration of fisheries and aquaculture into food and nutritional security policies and strategies

Integration cannot be uniformly enhanced across the countries. There can be no standard package or project design to achieve this. Standard indicators may be used to narrow down our choice of countries where enhancement of integration of fisheries and aquaculture into food security is feasible.

It is likely that the countries at the top of a 'potential list' are also the ones where integration levels are already high. However, if fish and fisheries are to make a difference in raising the level and quality of food and nutritional security in sub-Saharan Africa, then greater integration is warranted in the countries where the **need** is most. Such countries must be prioritized. However, catering to needs requires a modicum of supportive capabilities and measures, which should also be identified. Fundamental to this is information and assistance with awareness raising.

3.1 Where is the potential for enhancement?

The first task in the methodology for assessing the potential for fish and fisheries to play a role in food and nutritional security is to choose the indicators which need to be included.

Indicators

Five indicators were chosen and weighted according to the importance perceived for this study:

(1) Fish availability per capita per year (kg/person/year). Weighting: 2

(2) The per capita GDP at purchasing power parity (USD/person/year). Weighting: 3

(3) Water supply coverage (percent of population). Weighting: 2

(4) Sanitation coverage (percent of population). Weighting: 1

(5) Female literacy above 15 years (percent of women). Weighting: 2

Fish availability refers to the amount of fish retained in a country for consumption by the population. It is calculated by adding imports to the domestic production and deducting non-food uses and exports, all expressed in life weight equivalents. This quantity, divided by the population, gives us the indicator of "fish availability per capita per year". This is a good proxy for the amount of fish actually consumed by the population. As an average, it hides the variations in consumption between different income groups of the population and between those who prefer fish and those who do not. The higher the fish availability in a country the more fish will be available for consumption. *Availability* of a food item is the starting point for ensuring food security.

Per Capita GDP is the value of goods and services generated in the country divided by the population. This figure is expressed here at purchasing power parity (PPP). The PPP is a method used to 'level' the different countries with a technique which asks how much money would be needed to purchase the same goods and services in two countries, and uses that figure to calculate an implicit foreign exchange rate.

Using the PPP rate, an amount of money thus has the same purchasing power in different countries. PPP rates facilitate international comparisons of income, since market exchange rates are often volatile. The per capita GDP is an average measure of the potential level of *accessibility* of a food item.

Water supply and sanitation coverage provide a fair indication of the level of hygiene in a country. Hygiene is an important factor to ensure the health of a population. This in turn, ensures greater food consumption. When a person is unhealthy and sick due to his/her unsanitary living conditions and lack of potable water, consuming food does not contribute to his/her health and well-being because the body is less able to *absorb* nutrients in the food.

Female literacy[1] has been highlighted as one of the most crucial elements in contributing to food security. When women are literate they are more vigilant about the nutritional needs of their children and family. They can be offered greater *awareness* about food and nutritional security, if they have purchasing power; and if the water and sanitation situation is adequate. A heightened level of awareness will allow them to make more informed and responsible choices in ensuring greater food security for their family and themselves.

Level of potential

Four levels of potential were chosen: Low (1); Medium (2); High (3) and Very High (4).

The level of importance of any particular indicator was assessed by listing the countries in ascending according to the numerical value assigned for each one. Then a sub-grouping was made combining those countries having unit values within a particular range. Consequently, for each of the five indicators, the countries studied were grouped into four levels of potential.

The numerical units denoted after each country relate to the actual value of the relevant indicator. For example, under the Indicator: "Per Capita GDP", the unit (175) after Zimbabwe indicates that the per capita GDP was US $175.00 per person per year in 2009.

The resulting matrix of twenty cells, indicators (5) and potential levels (4), as shown in Table 4 below reflects the position of a country in relation to its potential with regard to an indicator. For example, there are countries with 'low' levels of water supply coverage (Madagascar and the Democratic Republic of Congo); or countries where a 'very high' percentage of females are literate (Kenya and Seychelles).

[1] Ref. United Nations University, UNU-Wider, World Institute for development Economics Research, Research Paper No. 2006/131 by Nira Ramachandran, 2006
Women, food security and nutrition in South Asia, http://www.eldis.org/id21ext/s2nr1g1.html

The main limitation with this procedure is that it is influenced by the timeframe to which the data pertains. Ideally, it would be useful to measure potential over time, rather than at a particular point in time. This can be achieved if the same set of indicators were assessed for this group of countries at different periods i.e. 2006, 2009, 2012, etc.

Table 4: Assessing the potential for fisheries to play a role in food and nutritional security

Indicator		Availability	Access	Utilisation	Utilisation	Stability
		Fish Availability per capita (kg/per/yr) 2009 Weighting: 2	Per Capita GDP in USD at PPP 2009 Weighting: 3	Water Supply Coverage (% of population) 2006 Weighting: 2	Sanitation Coverage (% of Population) 2006 Weighting: 1	Female Literacy above 15 years (%) 2009 Weighting: 2
Potential levels	LOW (1)	Ethiopia (0.2) Eritrea (0.6) Zimbabwe(1.4) Sudan (1.8) Rwanda (1.9) Burundi (2.2) Swaziland (2.4) Somalia (3.2) Kenya (3.4)	Zimbabwe (175) DRC (323) Burundi (344) Malawi (550) Somalia (575)*	Somalia (29) Ethiopia (42) DRC (46) Madagascar (47)	Eritrea (5) Ethiopia (11) Madagascar (12) Rwanda (23) Somalia (23)	Somalia (25.8) Ethiopia (27.0)
	MEDIUM (2)	DRC (5.1) Malawi (5.2) Tanzania (5.7) Madagascar (6.4) Zambia (7.6)	Eritrea (752) Ethiopia (872) Madagascar (929) Rwanda (953) Comoros (1,215) Tanzania (1,216)	Tanzania (55) Kenya (57) Zambia (58) Eritrea (60) Swaziland (60) Uganda (64) Rwanda (65)	DRC (31) Tanzania (33) Uganda (33) Comoros (35) Sudan (35) Burundi (41) Kenya (42) Zimbabwe (46)	Sudan (50.3) DRC (54.9) Eritrea (56.0)
	HIGH (3)	Uganda (13.5) Djibouti (18.5) Mauritius (22.5) Comoros (29.5)	Uganda (1,426) Zambia (1,516) Kenya (1,568) Sudan (2,258) Djibouti (2,262) Swaziland (4,900)	Sudan (70) Burundi (71) Malawi (76) Zimbabwe (81)	Swaziland (50) Zambia (52) Malawi (60)	Burundi (60.9) Zambia (61.3) Madagascar (623) Uganda (64.6) Tanzania (66.6) Rwanda (66.8) Malawi (67.0) Comoros (68.7)
	V. HIGH (4)	Seychelles (58.9)	Mauritius (13,576) Seychelles (17563)	Comoros (85) Mauritius (100) Seychelles (100)	Mauritius (94) Seychelles (100)	Kenya (82.0) Mauritius (85.3) Swaziland (86.2) Zimbabwe (89.4) Seychelles (92.3)

Sources: African Economic Outlook 2012; Africa HDR 2012

Index of potential levels

Since there are four levels of potential and a weighting assigned to each indicator, it is possible to generate an index (level x weighting) for each country with regard to any of the five indicators. Note that in any one of the 20 cells of the matrix, the index assigned will be the same for all the countries in that cell. For example, "low per capita GDP" will have an index of 2 (1 x 2) for all countries in that cell. Similarly "high level water supply coverage" will have an index of 6 (3 x 2); and a 'very high level of female literacy' will have an index of 8 (4 x 2).

By assigning an index in this manner, it should be evident that if a country has a 'low' level of integration for all five indicators, then it would get an index score of 10 (2 + 3 +2 + 1+ 2). This is the lowest possible index score. The highest score will be 40 – that is, if a country had a 'very high' level of integration for all five indicators (8 + 12 + 8 + 4 + 8). The multi-indicator index score for the countries thus ranges from 10 to 40. The results are shown in Table 5 below.

Table 5: Country ranking with regard to the potential for fisheries and aquaculture to play a role in food and nutritional security

No.	Country	Availability	Access	Utilisation	Utilisation	Stability	Total Score
		Fish availability per capita (kg/per/yr) 2009	Per Capita GDP in USD at PPP 2009	Water supply (% of population) 2006	Access to sanitation (% of population) 2006	Female literacy above 15 years (%, 2009	
1	Seychelles	8	12	8	4	8	**40**
2	Mauritius	6	12	8	4	8	**38**
3	Comoros	6	6	8	2	6	**28**
4	Uganda	6	9	4	2	6	**27**
5	Zambia	4	9	4	3	6	**26**
6	Swaziland	2	9	4	3	8	**26**
7	Kenya	2	9	4	2	8	**25**
8	Sudan	2	9	6	2	4	**23**
9	Tanzania	4	6	4	2	6	**22**
10	Malawi	4	3	6	3	6	**22**
11	Zimbabwe	2	3	6	2	8	**21**
12	Madagascar	4	6	2	1	6	**19**
13	Rwanda	2	6	4	1	6	**19**
14	Burundi	2	3	6	2	6	**19**
15	Eritrea	2	6	4	1	4	**17**
16	Djibouti	6	9	No Data	No Data	No Data	**15+**
17	DRC	4	3	2	2	4	**15**
18	Ethiopia	2	6	2	1	2	**13**
19	Somalia	2 (2007)	3 (2007)	2	1	2	**10**
20	S.Sudan	No data available					

Sources: African Economic Outlook 2012; Africa HDR 2012

Based on the total scores we can categorise the countries into four groups according to the level of potential for fisheries and aquaculture to play a role in food and nutritional security:

Countries with very high potential: Seychelles and Mauritius;

Countries with high potential: Comoros, Uganda, Zambia, Swaziland, Kenya and Sudan;

Countries with medium potential: Tanzania, Malawi, Zimbabwe, Madagascar, Rwanda and Burundi;

Countries with low potential: Eritrea, Djibouti, Congo DR, Ethiopia, and Somalia.

3.2 'Need' as a deciding factor for enhancement

In the context of food and nutritional security, if we calibrate countries according to their potential (as defined using the indicators in Table 4 and 5) we run the risk of betting on the strong and neglecting the weak. The countries which have potential are the countries which already have a reasonable supply of fish, a high per capita income, access to water and sanitation and at least medium levels of female education. To avoid this 'trap' we must uncover the countries which have a real 'need' to integrate more fish into the diets of their populations and consequently encourage more activities in fisheries and aquaculture.

To uncover those with the greatest need from among our sample of 20 countries, we have chosen five indicators to assess the extent of the 'need' for fish and fisheries to have a role in food security. The size of a country's population was also considered.

These indicators are: (1) fish availability per person; (2) food availability per person; (3) the prevalence of Vitamin A deficiency in the population; (4) the percentage of the population which is undernourished; and (5) the percentage of the population who live below the poverty line.

The cut off points with respect to the indicators are the following: the quantities below the African average (shown in the Table 6 below) in the case of fish and food availability; and the percentage above the African average or a percentage above 50 percent - whichever is least - in the case of Vitamin A deficiency; the population of undernourished and the population below the poverty line.

Our choice countries are shown in Table 6 below. If data for Somalia and South Sudan were available they would also, most likely, be included in the list.

Table 6: Countries where there is need to enhance the role of fisheries in food security

Country	Population (000's) 2009 (AOE 2012)	Fish Availability Per/Capita (Kg/year) 2009 (FAO)	Food Availability (kCal/per/day) 2003-2005 (AOE 2012)	Vitamin A deficiency prevalence (% population) 1995-2005 (HDR 2012)	Percentage undernourished 2006-2008 (AOE 2012)	International poverty line % (below US $1.00) 2001/06 (AOE 2012)
Burundi	8,303	2.2	1,630	28	63	81.3
Comoros	676	29.5	1,800	22	51	46.1
DRC	66,020	5.1	1,500	61	75	59.2
Djibouti	864	18.5	2,170		31	18.8
Eritrea	5,073	0.6	1,530	21	66	53
Ethiopia	82,825	0.2	1,810	46	44	39
Kenya *	39,802	3.4	2,040	84	30	19.7
Madagascar	19,625	6.4	2,010	42	35	67.8
Malawi *	15,263	5.2	2,130	59	29	73.9
Mauritius	1,288	22.5	2,880	9	6	...
Rwanda *	9,998	1.9	1,940	6	40	57
Seychelles	84	58.9	2,380	8	8	...
Somalia	9,133	3.2	...	.....	...	...
South Sudan	10,625**		1,890***		47***	50.6**
Sudan	34,206**	1.8	2,290	.....	20	46.0**
Swaziland	1,185	2.4	2,320	45	18	62.9
Tanzania *	43,739	5.7	2,010	24	35	88.5
Uganda	32,710	13.5	2,380	28	15	51.5
Zambia *	12,935	7.6	1,890	54	45	64.3
Zimbabwe *	12,523	1.4	2,040	36	39	61.9
Africa	**1,008,354**	**9.4**	**2,307**	**67**	**29**	**62.9**

*Notes: * where potential to raise awareness is also high (see Table 4); **: CIA website; ***: HDR*

If we compare the list of countries that have potential (Table 5) with those that have a real 'need' (Table 6) for fish and fisheries to play a more central role in food security the overlaps are as follows:

- Among the countries with high potential, Zambia and Kenya have the greater need;
- Among the countries with medium potential, all are in need: Tanzania, Malawi, Zimbabwe, Madagascar, Rwanda and Burundi;
- Among the countries with low potential, Eritrea, Congo DR and Ethiopia are in need.

3.3 Creating awareness about real needs

There has been significant debate in economic development circles about the distinction between the demands people make and their real needs. For example, people who are malnourished may not realise this fact and continue to follow unhealthy diet patterns. The role of good information and the availability of the human, physical and social capabilities to transmit this information to people, who need it most, is one of the major challenges in development practices. This is abundantly true with regard to food security issues.

Creating awareness about real needs is essential to achieve one's maximum development potentials. This is the 'slow option' for development but also the most sustainable path to this goal.

Fish may easily be made available. People may have the purchasing power to buy it. They may live in a clean environment. Yet, due to a variety of other factors, primarily inadequate knowledge and information, they may not consume fish. Therefore, creating awareness about fish, particularly its nutritional qualities, its relatively low cost and ease of preparation as a food, warrant far greater investment in effort, time and money than has hitherto been the case in countries in the ESA-IO region.

In order to select the countries from our list where awareness about fish and fisheries can be generated, the following criteria were developed (see Table 7 below):

- those countries with low or medium fish availability at the current (2009) levels;
- those countries where efforts have already been made to create awareness about fish through the mass media;
- those countries where nutrition awareness programs are in place;
- those countries where roads are reasonably good;
- those countries where there is significant use of mobile phones;
- and those countries where female literacy is high.

We have also included in Table 7 the population density of the country. This is one good proxy for the scope for 'diffusion' of awareness. If people live in close proximity, there are far better chances of 'word of mouth' communication which is most effective in rural areas. There is also a greater possibility for people to experience the 'show-how' and 'see-how' effects of fish in diets and fisheries, e.g. aquaculture in small ponds, for improved livelihoods.

Among the criteria selected we wish to highlight the importance of female literacy. This refers to literate mothers and home makers whose awareness and consequent actions or choices are most crucial in ensuring that fish will be factored into children's and family diets.

Based on the above criteria, the countries selected are: Kenya, Malawi, Rwanda, Tanzania, Zambia and Zimbabwe.

Together these six countries account for 33 percent of the population of the 20 ESA-IO countries in our study.

Table 7: Countries where the scope to raise awareness about the role of fisheries in food security is high

Country	Population density (pop/km2) (AEO 2012)	Female literacy (above 15 yrs) (AEO 2012)	Mobile line per 100 inhabitants (AEO 2012)	Paved roads (% to total) (AHDR 2012)	Nutrition awareness programs exist (Study questionnaire)	Publicity about fish in mass media (Study questionnaire)	Current Fish Consumption (2009) (FAO stats.)
Burundi	298	60.9	49.7	10.4	NO	NO	Low 2.2
Comoros	302	68.7	118	76.5	NO	YES	High 29.5
Congo Dem. Rep.	28	54.9	49.4	1.8	NO	NO	Medium 5.1
Djibouti	37	..	…	….	NO	NO	High 18.5
Eritrea	43	56	107.1	21.8	NO	YES	Low 0.6
Ethiopia	75	27	59.3	13.7	NO	NO	Low 0.2
Kenya	**67**	**82**	**76.3**	**14.1**	**YES**	**YES**	**Low 3.4**
Madagascar	33	62.3	67.5	11.6	NO	NO	Medium 6.4
Malawi	**129**	**67**	**17.4**	**45**	**YES**	**YES**	**Medium 5.2**
Mauritius	631	85.3	58.9	98	NO	NO	High 22.5
Rwanda	**380**	**66.8**	**13.7**	**19**	**YES**	**YES**	**Low 1.9**
Seychelles	185	92.3	49.7	96.5	YES	YES	V. High 58.9
Somalia	14	25.8	25.7	….	…	…	Low 3.2*
South Sudan	16	16	No Data	No data	YES	YES	Low (??)
Sudan	18	50.3	86.8		NO	YES	Low 1.8*
Swaziland	68	86.2	44.3	30	…	…	Low 2.4
Tanzania	**46**	**66**	**46.3**	**7.4**	**YES**	**YES**	**Medium 5.7**
Uganda	136	64.6	61.6	23	YES	YES	High 13.5
Zambia	**17**	**61.3**	**71.1**	**22**	**YES**	**YES**	**Medium 7.6**
Zimbabwe	**32**	**89.4**	**35.4**	**19**	**YES**	**YES**	**Low 1.4**
Africa	33		60.04				9.4

Looking back at Table 5 and Table 6, which show the countries with potential and real needs respectively, it can be seen that our current list of 6 countries are all included in the list of countries with real needs (Table 6). These fall into the categories of countries with high potential (Zambia and Kenya) and medium potential (Rwanda, Tanzania, Malawi and Zimbabwe) (Table 5).

Enhancing the integration of fish and fisheries into food and nutritional security is a task which all countries have the innate potential to effectively undertake. However, there are some countries where this potential is also in harmony with the population's need for better diets and improvement in their food security. Often such needs are not identified by policy makers. In some countries, although this need is perceived, the ability to raise awareness about it, and mechanisms to achieve this, may not exist.

Using a series of macro-indicators, a list of countries has been drawn up where the efforts at enhancing integration of fish and fisheries into food and nutritional security may be meaningfully commenced and pursued with reasonable success.

4. Assessing integration: words and deeds

The key objectives of this study are to examine the level and extent of fisheries and aquaculture integration into food and nutrition strategies and policy plans assessed at national and regional levels.

Two approaches will be adopted to achieve this objective.

Firstly an overall analysis of official documents will be made, which can be classified as 'policy documents'. For this exercise, the content of these documents will be given a broad-brush treatment. Our objective is to examine the degree of inclusion of issues pertaining to fisheries and aquaculture, with particular focus on food and nutritional security. This may be considered as 'integration by word'. This will be the key focus of this chapter.

Secondly, by building upon and combining with this content analysis, an attempt will be made to make a preliminary, but more 'quantitative, indicator-based' analysis to assess the degree of physical integration of fish and fisheries into the diets and economy of the respective countries. This will be known as 'integration by deed'. Finally we will identify those countries, that are food insecure and where fisheries play an important role, but where this important element is forgotten or overlooked in the policy discussion.

4.1 Integration by word: analysis of policy documents

It should be noted that the inherent limitations of any exercise that attempt a content analysis in search of particular aspects or emphasis within policy documents, are indeed subjective by nature. The outcome is conditioned by the choice of documents and their date of publication. Conclusions reached based on an analysis of a particular set of documents for a given country can be 'proven wrong', for example if a completely different set of documents pertaining to an earlier phase in time were analysed.

Bearing in mind the above, the following analysis was made both at the individual country level and the regional level. This analysis is based on documents brought to our attention as being some of the most relevant for the respective countries during the last five years. Many of the documents examined also pertain to the plans for the immediate future.

National Documents

As many as 89 national documents were closely examined from the 20 countries included in this analysis. In many cases, these include the UN Development Assistance Framework (UNDAF) for the country; the national food security action plans; food and agriculture sector policies; fishery policies and plans; nutritional strategy documents; country development plans; FAO medium term policy frameworks and so forth. (see Table 8 below for the quantitative analysis. For specific details on the documents examined for each country see Annex 3).

The aggregate analysis reveals that although every one of the countries included in the study had either a marine, riverine or lacustrine fishery (or a combination of these), as many as one fifth (21 percent) of the country documents made no reference to the fisheries sector. This lacuna is not just in countries such as Ethiopia or Zimbabwe where fish is not the preferred source of protein and fisheries is not a significant primary economic activity. Surprisingly, this oversight was observed in 50 percent of the documents analysed from Mauritius and Uganda where fish consumption is high and fisheries has significant economy activity.

Out of the 89 country documents, 57 of them (64 percent) specifically dealt with issues directly relating to food and nutritional security of the concerned country. From amongst these, as many as 20 documents (more than one third) made no reference to the role of fish.

National documents often exhibit a degree of schizophrenia with regard to references to the fisheries sector and fish in the context of food security.

In one country, the food policy document had some key references about the significance of fish in the food security of the poor. In the fishery policy of the same country however, the focus was entirely about commercializing the production and marketing without alluding to the role of fish in food security.

In two island nations, the action plans for food security and nutrition highlight the fact that fishing households are the most food insecure. Yet the UN Development Assistance Framework (UNDAF) documents of these nations, recognizing fisheries as a 'growth driving' sector make no mention of the role which fish can or should play in enhancing food security.

In one major fishing nation, where fish consumption is also very high, the UNDAF and FAO Country Support Strategic Framework put great emphasis on fisheries, aquaculture and fish as a source of food security, livelihoods and export earnings. However, the country's food and nutrition policy documents make no meaningful reference to the role of fisheries in food security.

Table 8: Review of ESA-IO countries policy documents with mention of fish and fisheries content

Country		Documents on food and nutritional plans and strategy analysed	Documents without any references to the fisheries sector	Documents containing issues relating to the fisheries sector	Documents specifically mentioning issues on food and nutritional security		
					Total	Documents in which fish is mentioned	Documents in which fish not mentioned
National Documents		**92**	**19**	**73**	**60**	**40**	**20**
		(100%)	**(21%)**	**(79%)**	**(65%) / (100%)**	**(67%)**	**(33%)**
Regional Documents		**10**	**4**	**6**	**7**	**6**	**1**
		(100%)	**(40%)**	**(60%)**	**(70%) / (100%)**	**(85%)**	**(15%)**
1	Burundi	4	2	2	2	1	1
2	Comoros	2	0	2	2	1	1
3	DRC	2	0	2	2	0	2
4	Djibouti	4	0	4	2	2	0
5	Eritrea	3	1	2	1	1	0
6	Ethiopia	6	2	4	1	0	1
7	Kenya	5	0	5	4	4	0
8	Madagascar	4	0	4	3	1	2
9	Malawi	5	1	4	5	4	1
10	Mauritius	2	1	1	2	1	1
11	Rwanda	4	1	3	1	1	0
12	Seychelles	4	0	4	4	3	1
13	Somalia	6	0	6	4	1	3
14	South Sudan	4	2	2	2	2	0
15	Sudan	5	1	4	3	2	1
16	Swaziland	6	2	4	3	3	0
17	Tanzania	8	1	7	6	5	1
18	Uganda	9	1	8	8	4	4
19	Zambia	5	1	4	4	4	0
20	Zimbabwe	4	3	1	1	0	1

Source: Content analysis of the documents reviewed during the study

4.2 Integration by deed: assessing integration through indicators per country

Plans and policies of a country greatly influence actions on the ground. Realities on ground realities, however, must also be adequately reflected in policies.

We have chosen five indicators with regard to the integration through 'actions and deeds' i.e. on the ground realities.

Indicators

The five indicators and weightings assigned to them according to the importance perceived for this study are given below:

(1) Fish availability per capita per year (kg/person/year). Weighting: 1

(2) The share of fish in animal protein intake (percentage). Weighting: 2

(3) The persons employed in fisheries (persons/1000 population). Weighting: 2

(4) The mention of fisheries issues in policy documents (percentage). Weighting:2

(5) The mention of fish in food security policy documents (percentage). Weighting: 3

Fish availability refers to the amount of fish retained in a country for consumption by the local population. It is calculated by adding imports to the domestic production and deducting non-food use and exports – all expressed in life weight equivalents. This quantity, divided by the population, gives the indicator of 'fish availability per capita per year'. This is a good proxy for what is actually consumed by the population as food. However, as an average, it hides variations in consumption between different income groups of the population and between those who prefer fish and those who do not. The higher the fish availability, the higher we can assume will be the integration of fish into food of the people thus contributing to their food security.

The share of fish in the animal protein intake of a population reflects, to an important degree, its protein preference. Generally, fish availability and the share of fish in animal protein are positively correlated. However, when the fish availability and the share of fish in animal protein together are examined, some of the 'outliers' in the relationship mentioned provide a different insight into the integration. Consider the case of Burundi and the Democratic Republic of Congo (DRC) (see Table 9 below). Burundi has low fish availability, only 2.2 kg/person/year and for for DRC the figure is 5.1 kg. However, the share of fish in the animal protein intake is almost 20 percent and 40 percent for Burundi and DRC respectively. This intake compares well to those countries with significantly higher fish availability levels, island nations such as Mauritius and Seychelles, and thus point to the greater 'criticality' of fish in the food and nutritional security of Burundi and DRC than might be assumed from the per capita data alone.

The persons employed in fisheries provide a perspective of the 'indirect' role of fish in food security. While those employed in fishery-related activities – harvesting, processing, and marketing – are likely to consume fish, it is the income generation dimension of fish which merits attention here. With their earnings, employees have access to greater food security. It is also their activity which plays an important role in ensuring availability of fish to consumers. If data was available on the scale of the enterprise these individuals are employed in, whether they are small-scale or large-scale operators, an insight into the structural nature of integration could be obtained.

The mention of fisheries and aquaculture issues in the policy and planning documents, as well as the role of fish in food security in the documents pertaining to food and nutritional security, are included here as indicators because this is the key focus of the study. What is considered is the mere fact of mentioning fisheries and fish in these documents, we have not entered into any assessment of the number of citations or the quality of the analysis made. This is another of the limitations of this study.

Integration levels

Four levels of integration were chosen:

Low (1); Medium (2); High (3); and Very High (4).

The level of importance of any particular indicator was assessed by listing the countries in ascending order according to the numerical value assigned for each of the indicators. Then a sub-grouping was made with countries having unit values within a particular range. Consequently, for each of the five indicators, the countries studied are grouped into four levels of integration.

The numerical value given after each country name relates to the actual value of the relevant indicator. For example, under the indicator, 'Fish availability per capita', the unit (0.2) after Ethiopia indicates that the per capita availability of fish (which is a proxy for 'consumption') was low at just 0.2 kg (200 grams) per person per year in 2009.

The resulting matrix, indicators (5) and integration levels (4), of 20 cells, given below in Table 9 reflects the position of a country in relation to its integration with respect to an indicator. To illustrate, there are countries with 'low' levels of fish availability (Ethiopia, Eritrea); and countries where a 'very high' percentage of policy documents mention the role of fish (Seychelles, Zambia).

One of the procedure's limitations is that the time period to which the data pertains is subject to change. For example, fish availability in a country may increase substantially in a particular year as a result of imports. This will then shift the country's position in the matrix.

Ideally, integration over time should be measured rather than at a particular time. This can be achieved if the same set of indicators were assessed for this grouping of countries at different time periods, for example, 2006, 2009, 2012. Such a procedure would give a better picture of the integration process.

Index of integration levels

Since there are four levels of integration and a weighting assigned to each indicator, it is possible to generate an index (level x weighting) for each country with regard to each of the five indicators.

Note that in any one of the 20 cells of the matrix, the index assigned will be the same for all the countries in that cell. For example, 'low level of fish availability' will have an index of 1 (1 x 1) for all countries in that cell. Similarly 'high number of persons employed in fisheries' will have an index of 6 (3 x 2); and a 'very high level of fish included in food security policy documents' will have an index of 12 (4 x 3).

By assigning an index in this manner, it should be evident that if a country had a 'low' level of integration for all five indicators, then it would get an index score of 10 (1 + 2 +2 +2 +3). This is the lowest possible index score. The highest will be 40, that is, if a country had a 'very high' level of integration for all five indicators (4 + 8 + 8 + 8 + 12). The multi-indicator index score for the countries thus ranges from 10 to 40. The higher the score, the greater the level of integration.

The results are given in Table 10 below. As data for South Sudan and Swaziland are unavailable, the scoring for these countries remains incomplete. Their rankings, however, are unlikely to change dramatically.

Table 9: Assessing the level of integration of fish and fisheries into food security

Indicator		Fish availability per capita (kg/per/yr) 2009 Weighting: 1	Fish share in animal protein (%) 2009 Weighting: 2	Persons employed in fisheries (per 1000 of population) Weighting: 2	Fisheries in policy (% of documents) Weighting: 2	Fish in food security policy (% of documents) Weighting: 3
Integration levels	**LOW (1)**	Ethiopia (0.2) Eritrea (0.6) Zimbabwe (1.4) Sudan (1.8) Rwanda (1.9) Burundi (2.2) Swaziland (2.4) Somalia (3.2) Kenya (3.4)	Ethiopia (1.0) Sudan (1.9) Eritrea (2.5) Zimbabwe (3.4) Swaziland (4.4) Kenya (5.4)	Ethiopia (0.1) Zimbabwe (0.1) Sudan (2) Djibouti (2) Eritrea (3) Rwanda (4) Zambia (4)	Zimbabwe (25)	Congo DR (0) Ethiopia (0) Zimbabwe (0)
	MEDIUM (2)	Congo DR (5.1) Malawi (5.2) Tanzania (5.7) Madagascar (6.4) Zambia (7.6)	Somalia (10.0) Rwanda (11.9) Mauritius (16.9) Madagascar (17.4) Burundi (19.7) Tanzania (20.7) Zambia (25.3) Malawi (28.4)	Mauritius (9) Madagascar (10) Congo DR (10) Burundi (14)	Sudan (40) Burundi (50) Mauritius (50) S. Sudan (50) Eritrea (66) Ethiopia (66) Swaziland (66)	Somalia (16) Burundi (25) Madagascar (25) Rwanda (25) Eritrea (33)
	HIGH (3)	Uganda (13.5) Djibouti (18.5) Mauritius (22.5) Comoros (29.5)	Uganda (33.3) Djibouti (33.8) Congo DR (39.6) Seychelles (46.8)	Somalia (20) Uganda (21) Kenya (22) Malawi (27)	Rwanda (75) Malawi (80) Tanzania (90) Zambia (80) Uganda (90)	Sudan (40) Uganda (45) Comoros (50) Djibouti (50) Mauritius (50) S.Sudan (50) Swaziland (50)
	V. HIGH (4)	Seychelles (58.9)	Comoros (70.2)	Comoros (48) Tanzania (50) Seychelles (66)	Comoros (100) Congo DR (100) Djibouti (100) Kenya (100) Madagascar (100) Seychelles (100) Somalia (100)	Kenya (80) Malawi (80) Seychelles (80) Tanzania (80) Zambia (80)

Table 10: Ranking of countries with regard to current level of integration of fish into food and nutritional security

No.	Country	Fish availability per capita 2009	Fish share in animal protein 2009	Fisheries employment (various years)	Fisheries in policy	Fish in food security policy	Total Score
1	Seychelles	4	6	8	8	12	**38**
2	Comoros	3	8	8	8	9	**36**
3	Tanzania	2	4	8	6	12	**32**
4	Malawi	2	4	6	6	12	**30**
5	Uganda	3	6	6	6	9	**30**
6	Kenya	1	2	6	8	12	**29**
7	Djibouti	3	6	2	8	9	**28**
8	Zambia	2	4	2	6	12	**26**
9	Mauritius	3	4	4	4	9	**24**
10	Madagascar	2	4	4	8	6	**24**
11	Somalia	1*	2*	6	8	6	**23**
12	DRC	2	6	4	8	3	**23**
13	Rwanda	1	4	2	6	6	**19**
14	Burundi	1	4	4	4	6	**19**
15	Sudan	1	2	2	4	9	**18**
16	Swaziland	1	2	No Data	4	9	**16+**
17	Eritrea	1	2	2	4	6	**15**
18	South Sudan	No Data	No Data	No Data	4	9	**13+**
19	Ethiopia	1	2	2	4	3	**12**
20	Zimbabwe	1	2	2	2	3	**10**
Source		FAO FishStat 2009; *2007		FAO Country Profiles	Analysis from this study		

Looking down the list of countries in Table 10 above, according to rank, there are no major surprises among the leading nations or the laggards, except for the fact that one would have expected to see Mauritius in the top five. There is also some 'inconsistency' between integration by deed (sum of the first three indicators) and integration by word (sum of the fourth and fifth indicators) in the case of Kenya and Zambia. In these countries, their actions on the ground compared to their policy proclamations, particularly with regard to making fish available to the population, is poor.

Table 10 above changes somewhat when using real numbers of documents rather than percentages. Table 11 below gives an interesting picture, in that the role of fisheries in policy papers and papers mentioning food security is high in countries such as Uganda and Somalia, while it is relatively low in countries such as Mauritius and Djibouti, where fisheries play an important role in the national economy.

Finally Table 12 tries to identify those countries where fish play an important role, either as a source of employment or as a source of income, but this role is not appropriately reflected in the policy papers. The identification of these countries is based on a simple calculation, subtracting from the weighting of fisheries (first three columns) the weighting of policy integration. The countries with the highest scores are those where fisheries are relatively important, but this importance is overlooked in policy papers. This calculation shows that nine countries in the region namely, Comoros, Seychelles, Djibouti, Mauritius, Malawi, Rwanda, Burundi, DRC and Zambia are in this category. Table 12 shows which of these countries are food insecure, which means that the role of fisheries, not reflected in the national economy, could potentially create even more food insecurity or that better integration of fisheries in the overall food security discussion could help the country to improve the nutritional situation of its inhabitants.

Table 13 shows that Comoros, Djibouti, Malawi, Rwanda, Burundi, DRC and Zambia are the countries where fisheries should be more integrated in policy discussions, in light of the importance of fisheries and the neglect of this element in policy papers.

Table 11: Assessing the integration of fisheries in food security (real terms)

Indicator		Fish availability per capita (kg/per/yr) 2009 Weighting: 1	Fish share in animal protein (%) 2009 Weighting: 2	Persons employed in fisheries (per 1000 of population) Weighting: 2	Fisheries in policy (number of documents) Weighting: 2	Fish in food security policy (% of documents) Weighting: 3
Integration levels	**LOW (1)**	Ethiopia (0.2) Eritrea (0.6) Zimbabwe (1.4) Sudan (1.8) Rwanda (1.9) Burundi (2.2) Swaziland (2.4) Somalia (3.2) Kenya (3.4)	Ethiopia (1.0) Sudan (1.9) Eritrea (2.5) Zimbabwe (3.4) Swaziland (4.4) Kenya (5.4)	Ethiopia (0.1) Zimbabwe (0.1) Sudan (2) Djibouti (2) Eritrea (3) Rwanda (4) Zambia (4)	Zimbabwe (1), Mauritius (1)	Djibouti (0) Eritrea (0) Kenya (0) Rwanda (0) S. Sudan (0) Swaziland (0) Zambia (0)
	MEDIUM (2)	Congo DR (5.1) Malawi (5.2) Tanzania (5.7) Madagascar (6.4) Zambia (7.6)	Somalia (10.0) Rwanda (11.9) Mauritius (16.9) Madagascar (17.4) Burundi (19.7) Tanzania (20.7) Zambia (25.3) Malawi (28.4)	Mauritius (9) Madagascar (10) Congo DR (10) Burundi (14)	Burundi (2) Comoros (2) Congo DR (2) Eritrea (2) S. Sudan (2) Rwanda (3)	Burundi (1) Comoros (1) Ethiopia (1) Malawi (1) Mauritius (1) Seychelles (1) Sudan (1) Zimbabwe (1)
	HIGH (3)	Uganda (13.5) Djibouti (18.5) Mauritius (22.5) Comoros (29.5)	Uganda (33.3) Djibouti (33.8) Congo DR (39.6) Seychelles (46.8)	Somalia (20) Uganda (21) Kenya (22) Malawi (27)	Djibouti (4) Ethiopia (4) Madagascar (4) Malawi (4) Seychelles (4) Sudan (4) Swaziland (4) Zambia (4)	Congo DR (2) Madagascar (2)
	V. HIGH (4)	Seychelles (58.9)	Comoros (70.2)	Comoros (48) Tanzania (50) Seychelles (66)	Kenya (5) Somalia (6) Tanzania (7) Uganda (8)	Somalia (3) Tanzania (5) Uganda (4)

Table 12: Ranking of countries with regard to mismatch between importance of fisheries and presence of fisheries in policy papers

No.	Country	Fish availability per capita 2009	Fish share in animal protein 2009	Fisheries employment (various years)	Fisheries in policy	Fish in food security policy	Total score C + D + E - F - G
1	Comoros	3	8	8	4	6	9
2	Seychelles	4	6	8	6	6	6
3	Djibouti	3	6	2	3	3	5
4	Mauritius	3	4	4	2	6	3
5	Malawi	2	4	6	6	6	0
6	Rwanda	1	4	2	4	3	0
7	Burundi	1	4	4	4	6	-1
8	DRC	2	6	4	4	9	-1
9	Zambia	2	4	2	6	3	-1
10	Eritrea	1	2	2	4	3	-2
11	Kenya	1	2	6	8	3	-2
12	Zimbabwe	1	2	2	2	6	-3
13	Madagascar	2	4	4	6	9	-5
14	Uganda	3	6	6	8	12	-5
15	Tanzania	2	4	8	8	12	-6
16	Ethiopia	1	2	2	6	6	-7
17	Sudan	1	2	2	6	6	-7
18	Somalia	1	2	6	8	12	-11
19	South Sudan	No Data	No Data	No Data	4	3	NA
20	Swaziland	1	2	No Data	6	3	NA

Table 13: Identification of countries with regard to mismatch between the importance of fisheries and the presence of fisheries in policies papers and their food insecurity

No.	Country	Total score (from Table 12)	Food Availability (kCal/per/day)	Food insecure (below 2,300 kCal - African average)
1	Comoros	9	1,800	yes
2	Seychelles	6	2,380	no
3	Djibouti	5	2,170	yes
4	Mauritius	3	2,880	no
5	Malawi	0	2,130	yes
6	Rwanda	0	1,940	yes
7	Burundi	-1	1,630	yes
8	DRC	-1	1,500	yes
9	Zambia	-1	1,890	yes

4.3 Aggregated analysis for the Regional Economic Communities

The African Union has accepted eight Regional Economic Communities (REC), which are considered as its building blocks. These RECs are central to the strategy for implementing the New Partnership for Africa's Development (NEPAD). There are also 6 sub-regional RECs. Many countries have membership in more than two or three RECs.

Regional Documents

Our content analysis also included ten regional documents on: the food and hunger scenarios of the Horn of Africa; the Indian Ocean Commission; East African countries; the Southern African Development Commission (SADC); and the Inter-governmental Authority on Development (IGAD). In these documents, as many as four (40 percent) make no reference to the fisheries sector. Seven (70 percent) of these regional documents dealt specifically with issues on food security, which means that 30 percent of the regional policy papers do not deal with food security issues. Even in the seven regional policy papers, two of these documents (15 percent) make no mention of the role of fish in food security. This neglect of the role of fish stands out distinctly.

A document pertaining to the Indian Ocean Commission (IOC) composed of island states, indicates:

> *This report has been commissioned and funded by IGAD, following a request from IOC to the EU, for a study on food production and food security and poverty reduction in the IOC and the design of a Food Security strategy suitable for the region, with possible synergies of trade with the IGAD region.*

What follows in the document is an elaborate analysis of the food production, consumption and food requirements for the future in five islands of the IOC Region – Comoros, Madagascar, Mauritius, Reunion Island and Seychelles. Fish, however, is never mentioned in this document.

If the omission was by design, then this is unfortunate because fish is the main source of protein in the food and nutritional security of these countries. Moreover fisheries are the growth driving engines of these island economies. It questions the relevance of such a document for the planning process.

In our analysis we consider the role of four RECs and one sub-regional REC with regard to the potential to enhance the integration of fish into food security. These include the Common Market for Eastern and Southern Africa (COMESA); the East African Community (EAC); the Inter-Governmental Authority for Development (IGAD); and Southern African Development Community (SADC). The one sub-regional REC is the Indian Ocean Commission (IOC).

The same indicators used for the individual countries were used for the aggregated analysis undertaken for each of the RECs with regards to integration and the potential for fish and fisheries to play a role in food security. The indicators were classified into four levels as in the country analysis.

However, in the case of the RECs, the criterion used for the classification of the levels of each indicator was not the same as used for the analysis of the 20 individual countries. As there were five RECs, it was not possible to arrive at 'clusters' of values for each of the indicators. Thus the all-African average was used as a benchmark for categorising the RECs into different levels for each specific indicator. The cut off points were determined as follows:

LOW	When the indicator was below 0.5 of the African average
MEDIUM	When the indicator was between 0.5 and up to the African average
HIGH	When the indicator was between the African average and up to 1.5 above it
VERY HIGH	When the indicator was above 1.5 of the African average

An important point to be noted with respect to the process of making aggregated indicators for each of the RECs is that, as for the individual countries, the population sizes of the RECs are very different. For example, the IOC encompasses four countries and has a total population of only 21.6 million, whereas the COMESA has 17 of our sample countries as members with a population of 440.6 million. The indicators for each REC were weighted by their respective population size. This weighting has a significant impact on the results as will be illustrated below.

Level of integration

The first part of this analysis consists of an assessment of the level of integration of fish and fisheries into food security. The five indicators selected for this assessment are the same as those defined in section 4.2.

Table 14: Assessing the level of integration of fish and fisheries into food security in RECs

		1	2	3	4	5
Indicator		**Fish availability per capita (kg/per/yr) 2009 Weighting: 1**	**Fish share in animal protein (%) 2009 Weighting: 2**	**Persons employed in fisheries (per 1000 of population) Weighting: 2**	**Fisheries in policy (% of documents) Weighting: 2**	**Fish in food security policy (% of documents) Weighting: 3**
Integration levels	**LOW (1)**	IGAD (3.38)	IGAD (7.1)	IGAD (8.2)	-	IGAD IOC
	MEDIUM (2)	EAC (6.38) COMESA (6.62) SADC (6.69) IOC (8.15)	COMESA (14.6) SADC (15.1) EAC (16.9) IOC (18.6)	COMESA (8.9) IOC (11.4) SADC (13.6)	-	EAC SADC
	HIGH (3)	-	-	-	-	-
	V. HIGH (4)	-	-	EAC (28.9)	-	-
African average		9.4	19.1	16.57	-	-

It should be noted that in the analysis of RECs, when the integration of fisheries is considered 'by word', only policy documents which dealt specifically with food security were considered and reviewed (column 5 of Table 14).

From Table 14 it is apparent that IGAD is clearly the REC with the lowest level of integration. This is mainly due to the fact that the bigger countries in this REC are land-locked and culturally have a very low preference for fish as a source of protein. All the remaining four RECs are positioned in the medium level of integration.

To illustrate the impact of the weighting by population size a good example is the IOC, which is composed of, four island nations of which Madagascar alone has a population of approximately 19 million and the other three combined have a total of only 2 million. If Madagascar were excluded from the aggregation, then in Table 14 above, the 'fish availability per capita' would move to a 'very high' ranking (20.2 kg/per capita/year), whilst the 'fish share in animal protein' (22.7 percent) and employment in fisheries (24 persons/1000 population) would score a 'high'. This would therefore make the IOC the REC with the greatest level of integration of fish and fisheries in food security.

This illustration reflects the heterogeneity of the countries included in the RECs, and the complexity and caution with which this regional analysis needs to be undertaken.

Table 15: Ranking of RECs with regard to the importance of fish and fisheries for the member countries and food security

		A	B	C	D	
Rank	**REC**	**Fish availability per capita 2009**	**Fish share in animal protein 2009**	**Fisheries employment (various years)**	**Fish in food security policy documents**	**Total score (A+B+C+ D)**
1	EAC	2	4	8	3	**11**
2	SADC	2	4	4	6	**4**
3	IOC	2	4	4	3	**7**
4	COMESA	2	4	4	0	**10**
5	IGAD	1	2	2	3	**2**

In the EAC the fisheries sector has the greatest importance ('integration by deed', total of rankings from columns 1-3). This importance is quite high also for SADC, IOC and COMESA. However, when considering the integration of fish into the food security policy documents ('integration by word', column 4), only SADC has a high score. Scores for the EAC and COMESA proved to be unsatisfactory. When comparing the importance of fish in these regions, the importance given to this in policy papers on food security is poor. Even the IOC, which is composed of island nations, does not perform well. In IGAD countries, where fish does not really play an important role, the ranking, which the region gets with regard to the integration of fisheries in policy documents seems adequate.

Overall, there is room for improvement with regard to the integration of fisheries in food security policy documents in three regions namely: the EAC, IOC and COMESA. It is strongly recommended that these RECs start working in this direction.

Potential for fisheries in food security

The level of potential for fisheries to play a role in food and nutritional security was also assessed. The results for the five RECs are shown in Table 16.

Table 16: Assessing the potential for fisheries to play a role in the food and nutritional security of RECs

Indicator		Availability	Accessibility	Utilisation	Utilisation	Awareness
		Fish availability per capita (kg/per/yr) 2009 Weighting: 2	Per Capita GDP in USD at PPP 2009 Weighting: 3	Water supply coverage (% of population) 2006 Weighting: 2	Sanitation coverage (% of population) 2006 Weighting: 1	Female literacy above 15 years (%) 2009 Weighting: 2
Potential levels	LOW (1)	IGAD (3.38)	EAC (1,298) IGAD (1,388)		IOC (17%)	
	MEDIUM (2)	EAC (6.38) COMESA (6.62) SADC (6.69) IOC (8.15)	IOC (1,754) COMESA (2,180) SADC (2,955)	IOC (46%) IGAD (52%) EAC (61%) SADC (61%) COMESA (62%)	IGAD (26%) EAC (35%) SADC (39%)	EAC (28.9%) SADC (33.7%) IOC (36.7%) COMESA (43.5 %)
	HIGH (3)	-	-	-	COMESA (42%)	IGAD (49.5%)
	V. HIGH (4)	-	-	-	-	-
African average		9.4	2 779	64%	41%	45%

Given the five indicators selected, most of the RECs were found to have a 'medium' level of potential for fish and fisheries to play a role in food and nutritional security. According to these results, the RECs can be separated into two groups; the first group includes COMESA, SADC and IOC; whilst EAC and IGAD have a lower ranking (see Table 17 below).

Table 17: Ranking of RECs with regard to the potential for fish and fisheries to play a role in food and nutritional security

Rank	REC	Availability	Accessibility	Utilisation	Utilisation	Awareness	
		Fish availability per capita (kg/per/yr) 2009 Weighting: 2	Per Capita GDP in USD at PPP 2009 Weighting: 3	Water supply coverage (% of population) 2006 Weighting: 2	Sanitation coverage (% of population) 2006 Weighting: 1	Female literacy above 15 years (%) 2009 Weighting: 2	Total Score
1	COMESA	4	6	4	3	4	**21**
2	SADC	4	6	4	2	4	**20**
3	IOC	4	6	4	2	4	**20**
4	EAC	4	3	4	2	4	**17**
5	IGAD	2	3	4	1	6	**16**

An assessment looking at the need to enhance fishery integration in the RECs was also possible. The indicators for the RECs are given in Table 18.

Table 18: RECs needs in terms of enhancing the role of fisheries in food security

	1	2	3	4	5	6
REC	**Population (000's) 2009**	**Fish availability per capita (Kg/year) 2009**	**Food availability (kCal/per day) 2003 - 2005**	**Vitamin A deficiency prevalence (population %) 1995 - 2005**	**Percentage undernourished 2006 - 2008**	**International poverty line (% below US$1.00) 2001 - 2006**
COMESA	440,867	6.62	2,205	50	41	42
IGAD	203,547	3.38	2,040	51	32	36
EAC	134,552	6.38	2,080	42	31	55
SADC	270,353	6.69	2,061	44	48	61
IOC	21,674	6.38	2,057	39	34	75
Africa	**1,008,354**	**9.4**	**2,363**	**40**	**23**	**40**

Using the criteria set for the individual countries (see Section 4.2), all the RECs would be included as regions with a need to enhance the role of fisheries. However, some considerations can be made to further differentiate the regions.

IGAD is the REC with the lowest per capita availability of both fish and food availability (column 2 and 3), and has the highest vitamin A deficiency ratio (column 4), and the second lowest percentage of undernourished people (column 5).

Raising the fish consumption level can contribute significantly to solving the vitamin A deficiency. SADC countries show the highest levels of undernourishment. This is despite the fact that this region has the highest per capita availability of fish amongst the RECs. This indicates that higher fish consumption alone does not necessarily ensure higher food security. Dietary habits and the consumption of other foods are also crucial. The IOC region ranks in the middle compared to the remaining four RECs. The poverty level (column 6) is very high and strongly driven by the poor performance of Madagascar.

Final comments on the assessment for the regional economic communities

For the RECs analysis, a questionnaire similar to the one sent to the focal points in the countries was prepared. Unfortunately, despite several attempts, we did not receive any feedback from the focal points in the RECs. From the analysis of the documentation available, as well as considering the unsuccessful process of consultation, we conclude that fisheries do not seem to be a priority sector for the planning and activities of the RECs. What is worrying though is that in the IOC, where fish is central to the economy and diet, food security policy documents poorly reflect the role of fish and fisheries. As discussed in Chapter 2 above, this lack of integration of fisheries in the food security policy scenario might be attributed to the low participation of national fishery officers in policy design. It also points to a lack of general awareness of the relevance of fisheries in the region.

How best can we address these anomalies? What measures need to be taken to have greater congruence between words and deeds?

4.4 Merging words with deeds: Improving policy and practice

Policies may be considered as guides for action. Policy can also be defined as making decisions that reflect values and allocating resources based on such values. Policies may contain guidelines, principles or directions on what is to be done, who is to do it, how it is to be done and who stands to benefit. Thus, policy represents a particular political, ethical, or programmatic viewpoint. A country's policy reflects theoretical or experiential assumptions about what is required to resolve a particular issue or problem.

In developing countries and in the sub-Saharan countries in particular, the issues of poverty, hunger, food and nutritional security are all central to the present and future prospects of human and economic development. Policy formulation on these issues requires a clear understanding of the realities on the ground.

Unfortunately, government policy formulation procedures have become exercises which are increasingly 'top-down' with the involvement of 'expert consultants' and undertaken (perhaps) with tight time schedules. These policies are then, passed down to the departments, organizations or groups responsible for implementing the policy. Finally, the impacts reach the people who are affected by the policy. Often, policies cannot be integrated with reality and so they remain solely on paper.

Ensuring greater integration in policies

From our analysis of policy documents, the inadequacy of integration of fisheries and aquaculture in policies that pertain to food and nutritional security is clearly evident. Unquestionably, there are deficiencies in the *process* of policy formulation.

There are at least three important measures that could be taken to rectify these deficiencies.

Firstly, integration presupposes greater participation of at least two interest groups, those responsible for implementing the policy and those affected by the policy. To start with, policy formulation must incorporate some structured or mandatory requirement for greater participation of national-level officers who represent the fisheries sectors. Our analysis of the awareness and knowledge of the fishery officers (see Chapter 2 above) points to a reasonably high level of understanding of the role of fish in food and nutritional security. This would not have been possible if they did not have adequate academic attainments, and field level involvement. An important strategy to achieve such participation would be for national governments to have mandated requirements for well informed and motivated officers involved in the policy making process with external consultants.

A second measure for greater integration would be to strengthen institutional memory. There is an important corpus of studies that have been completed at the national and regional levels on various aspects of fish and fisheries. These form an important body of knowledge and evidence relating to the various patterns of fish production and consumption in the ESA-IO countries.

Every time a new policy formulation is commissioned, it should be made mandatory to review the existing fund of knowledge. There is no rationale or justification for re-inventing the wheel.

A third measure for greater integration lies in more focused capacity development of officers dealing with fish and fishery issues at the national level. Specific training programs are needed for middle- and top-level officers on data requirements for policy formulation and how this data should be converted to information elements for policy. For example, capable officers should be encouraged to formulate policy briefs by themselves, substantiated with data and credible information; highlighting the significance of fish and fisheries; and direct and indirect paths for achieving food security in the country.

If in the short and medium term, the above-mentioned measures can be implemented, there is likely to be more integration of the importance of fish and fisheries into the food security policies of countries of the ESA-IO region.

If there is structured involvement of the various interest groups in the fisheries and aquaculture sector in the policy development process, a far greater level of integration can be achieved (bottom-up approach). These may include: arranging for public hearings; consultation with local level organisations of fishers and fish harvesters the processing industry, the fish distributors and traders; inputs from NGOs working in the sector; sourcing ideas from food and nutrition extension workers and mothers who gather at health and nutrition clinics and so forth.

Greater integration can also come from a top-down approach involving senior political leaders. This can be achieved by well-planned and short (one-day) awareness and policy workshops organized with support from international organisations such as the FAO/UN, World Food Program (WFP), UNICEF and others. Such events[2] need to be high profile at national or regional levels. They should be followed through systematically with publicity, awareness programs, demonstration vents and so forth. These events must link with the political and electoral interests of top policy makers.

[2] A good example is the “Fish For All” summit held in Abuja, Nigeria in 2005.

5. Conclusions

A preliminary assessment of the integration of fisheries and aquaculture into the food and nutrition policy frameworks of the East and South Africa and Indian Ocean countries was attempted as part of this study. This initiated the understanding of factors that aid and hinder integration as viewed by fishery officers of the 20 countries involved. There is always a desire to raise the levels of integration of fisheries into policy and fish into diets. This practice may not be possible or viable in every country.

Countries with the potential for integration and countries with a real need were then examined. The latter was the focus of our attention because greater integration of fisheries and fish is the challenge of the SmartFish program. It is necessary to raise awareness of this point: this is only possible in countries where the right conditions exist to create awareness. Our foregoing analysis led to the creation of a list of six countries: *Kenya, Malawi, Rwanda, Tanzania, Zambia and Zimbabwe.* Together they account for a third of the population in our study of 20 countries. Currently fish consumption is not high in these countries but they have the resources and ecosystem potential for expansion of their fisheries. This can raise food security both directly (increasing the consumption of fish) and indirectly (creating jobs, raising income, etc. leading to a greater purchase and consumption of fish).

From the REC analysis it is apparent that there are also consolidation measures that can be undertaken regionally and these should also be attempted simultaneously. There is synergy in linking national and regional initiatives. Most measures call for greater levels of cooperation between the various departments of countries. Integration is possible only with genuine and committed cooperation. Emphasis must be placed on capacity building and greater participation, directly and indirectly, in the policy making process.

Whilst the debates on 'right to food' rage on in policy arenas of international development discourse, millions of people go hungry. Equal numbers eat but do not necessarily the same or adequate nourishment from their meals to prepare their bodies for a hard day's work. It is in such contexts where sourcing foods, which are readily available and affordable, attains significance.

Chapter 4 assesses the degree of integration in 'word and deed', in seven countries in this study namely: Comoros, Djibouti, Malawi, Rwanda, Burundi, Democratic Republic of Congo and Zambia. These countries were identified fish as being important but presently overlooked in policy discussions. By integrating these countries with those identified above as having potential for increased fish consumption, a final list of five countries where SmartFish could start advocacy work can be drawn up: Comoros, Djibouti, Malawi, Rwanda, and Zambia.

Some countries are of particular interest, such as Mauritius: Mauritius ranks as one of the countries with a very high potential for fisheries and aquaculture to play a role in food and nutritional security.

However, in terms of the integration of fisheries and aquaculture, Mauritius ranks in the medium range, whilst in the analysis of the mismatch between the importance of fisheries and its inclusion in policies, it is listed in the upper ranks. This puts Mauritius in a strange position, since fisheries already seem to play a very relevant role in terms of food security however, not enough importance is given to the sector in national policies. Therefore, it seems relevant to include Mauritius among those countries where SmartFish should implement activities, given the focus of interventions could be on policies and means of enhancing fisheries integration in the food security scheme, and the redesign of policies to improve the consideration of fisheries when it comes to food security. This could be considered as a higher intervention in terms of enhancing the inclusion of fisheries in food security policies, since consumption is already high in a non-food insecure country. It could also provide lessons for application in the first five countries selected, where consolidation of the fisheries and aquaculture sector in national food security is at an earlier stage. It would also help to assess the particular requirements in terms of policy interventions for island nations, in order to widen the spectrum of actions to adopt towards strengthening the contribution of fisheries to national food and nutritional security.

Consequently, it is recommended interventions by the SmartFish program in *Comoros, Djibouti, Malawi, Rwanda, Zambia and Mauritius*, be designed to include advocacy work towards the promotion of consumption, capacity building, and deepening awareness of the need to include fisheries in national food security policies, and at the same time, take into consideration the particular needs and characteristics of these nations.

This is the challenge of flavouring fish into food security.

References

ADB, OECD, UNDP, UNECA 2012: African Economic Outlook, 2012

FAO, 1993: Marketing and consumption of fish in eastern and southern Africa: Selected country studies. FTP 332, Rome

FAO, 2010: Post-harvest losses in small-scale fisheries: case studies in five sub-Saharan African countries. FTP 550, Rome

FAO, 2012: The State of Food Insecurity in the World 2012, Rome

FAO, 2012: The State of Fisheries and Aquaculture, 2012, Rome

Haug, A. et al, 2010: Use of dried Kapenta (*Limnothrissa miodon* and *Stolothrissa tanganicae*) and other products based on whole fish for complementing maize-based diets, AJFAND Online Vol. 10 No. 5

ICLARM/GTZ, 1991: The Context of Small-Scale Integrated Agriculture-Aquaculture Systems in Africa: A Case Study of Malawi, Manila

MRAG, 2005: Review of Impacts of Illegal, Unreported and Unregulated Fishing on Developing Countries: Synthesis Report, London

NEPAD, 2005: HIDDEN HARVESTS: Unlocking the Potential of Aquaculture in Africa, Technical Review Paper, Aquaculture, NEPAD, Fish for All Summit, Abuja

UNDP, 2012: Africa Human Development Report 2012: Towards a Food Secure Future, New York

WorldFish, 1995: Fish Supply and Food Security for Africa, Penang

WorldFish, 2009: Aquaculture, Fisheries, Poverty and Food Security, Working paper 2011-65, Penang

World Bank, 2011: African Development Indicators 2011, Washington

World Bank, 2011: The Little Data Book on Africa, Washington

Annex 1. Member countries of the Regional Economic Commissions

COMESA Common Market for Eastern and Southern Africa
EAC East African Community
IGAD Inter-Governmental Authority for Development
IOC Indian Ocean Commission
SADC Southern Africa Development Community

	Country	COMESA	EAC	IGAD	IOC	SADC
Included in the study	Burundi	✓	✓			✓
	Comoros	✓			✓	
	DRC	✓				✓
	Djibouti	✓		✓		
	Eritrea	✓		✓		
	Ethiopia	✓		✓		
	Kenya	✓	✓	✓		
	Madagascar	✓			✓	✓
	Malawi	✓				✓
	Mauritius	✓			✓	✓
	Rwanda	✓	✓			
	Seychelles	✓			✓	✓
	Somalia					
	South Sudan					
	Sudan	✓		✓		
	Swaziland	✓				✓
	Tanzania		✓			✓
	Uganda	✓	✓	✓		
	Zambia	✓				✓
	Zimbabwe	✓				✓
Not included in the study	Angola					✓
	Botswana					✓
	Egypt	✓				
	Lesotho					✓
	Libya	✓				
	Mozambique					✓
	Namibia					✓
	Reunion Is.				✓	
	South Africa					✓

Annex 2. Consolidating integration: what can be meaningfully achieved

Consolidating the integration process would be a logical conclusion to the steps taken in the main body of the report. Consolidation can be undertaken at all levels: regional, national and local. It would therefore be best to consider a series of contemporary actions, which will provide linkages to all levels. What follows is a list of actions that can be meaningfully started and reasonably achieved within the time frame of the project.

This list is by no means exhaustive, however, it is based on one premise: that greater participation and a more people-friendly approach to policy-oriented and policy-related actions is a desirable process. This will lead to more sustainable outcomes of which different stakeholders will take ownership. The list also takes into consideration many of the suggestions made by the fishery officers and integrates the needs and potentials of the countries identified where consolidation approaches are a priority. Many actions can be applied at the regional level.

The important responsibility and moral obligations that nations must exercise to fulfil the right to food for their populations is the most fitting backdrop for this proposed set of actions.

The UN Special Rapporteur on the Right to Food submitted an Interim Report on the role of fishers, fish workers and fisheries with regard to the debate on the right to food to the UN General Assembly on 30 October 2012[3]. The report covers a wide range of topics that are of central value to the issue of greater integration of fish and fisheries into the food and nutritional security of UN member states. The first recommendation of the report reads:

States should discharge their duties to respect, protect and fulfil the right to food in the fisheries sector by moving towards sustainable resource use while ensuring that the rights and livelihoods of small-scale fishers and coastal communities are respected and that the food security of all groups depending on fish is improved. This is a difficult balance to strike, but, without swift and bold action by States, the contribution made by fisheries to securing the right to food will diminish, with considerable consequences, in particular for poorer rural communities that depend on fisheries for both their nutritional needs and their income. Both coastal and flag States should accept their duties in this regard and should actively involve the fishing communities themselves, both in fisheries management and in the design and implementation of policies in adjacent sectors that could affect fishing.

[3] http://www.un.org/ga/search/view_doc.asp?symbol=A%2F67%2F268&Submit=Search&Lang=E

If nation states accept this call for action, then mainstreaming fish into food and nutritional security can be seen as a moral obligation from the perspective of the right to food.

Let's not reinvent the policy wheel: follow-up of major studies

(National/Regional)

Many important aspects pertaining to fish in relation to food security issues have been covered by some major studies in the countries of the ESA-IO region. Three of these that are relevant to the questions of integration, potential, needs and awareness of are the following:

- The Context of Small-Scale Integrated Agriculture-Aquaculture Systems in Africa: A Case Study of Malawi, ICLARM/GTZ, Manila 1991;
- Marketing and consumption of fish in eastern and southern Africa: Selected country studies, FAO Fisheries Technical Paper 332, FAO Rome 1993;
- Post-harvest Losses in Small-scale Fisheries: Case Study in five sub-Saharan Countries, FAO Technical Paper 550, FAO Rome 2010.

These are examples of studies that are well documented, based on extensive field investigations, written by, or based on the work of nationals, often officers of fisheries departments and fishery research institutions, from the respective countries, or people who have a lot of experience in the region. These studies are filled with an enormous amount of valuable data and information, and have provided many practical suggestions that make good inputs for policy making. Some of the suggestions may be dated; but others are still valid.

It would therefore be appropriate to review and build on this corpus of knowledge. Many of the authors may still be around. It would be useful to get them involved along with other appropriate people from the respective countries to re-visit the action and policy suggestions made in these studies and come up with a fresh, refurbished list based on the current realities. A regional workshop based on this idea of building on accumulated knowledge could become a good model for what is needed in other food security related sectors as well.

This would be a good start to stop the huge amount of effort, time and money, which is being spent on re-inventing the policy wheel.

Policy brief competition and regional high-level workshop

(National/Regional)

At the national level, as can be seen in the study, good talent exists among the officers in the respective fishery departments. It would therefore be appropriate and necessary to raise the capacity of these officers of the ESA-IO region in order to involve them in policy making at both the national and regional level. It would be fitting to propose a collective policy brief writing competition followed by a regional high-level workshop.

The purpose of introducing a competition is to encourage the appropriate-level officers to make an extra effort, on a collective basis, which could be rewarded by a formal certificate of recognition and a study visit to another country in the region. Short-listed policy briefs could form the background documents for a one-day high–level workshop for top policy makers and political leaders of the region on the subject of integrating fish into food security. Collaboration with New Economic Partnership for African Development (NEPAD) and its Partnership for African Fisheries initiative could also be beneficial.

Capacity building training in data needs for food security initiatives *(Regional)*

There is paucity of good data; lack of awareness about where to source existing data; as well as the need to better equip people with simple techniques on how to use data and information. Middle-level officers who have the responsibility to further the cause of integrating fish and fisheries into food and nutritional security policies, plans, campaigns, projects etc. could benefit greatly from such a training program spread over a week or ten days. Such a program should also involve field visits, data collection and processing to provide participants with first-hand knowledge of the difficulties, pitfalls and complications of translating 'concrete reality' into 'general statements' and policy inputs.

Inter-departmental initiative for fish in food security *(National)*

One of the inherent structural weaknesses of governance mechanisms is the manner in which the initiative of integrating fish into food security policy in the fisheries department of a country is restricted. This is true with regard to other policy processes as well. A small initiative in one country (where inter-departmental cooperation can be fostered without too many bureaucratic or political hurdles and where fisheries is a 'growth sector') to organise a two or three day workshop to examine the roles which different government departments – fisheries, water, agriculture, food and nutrition, rural development, commerce, health, women's affairs, transport and roads, finance etc. – have in fostering greater harmonisation of policy formulation should be attempted. Issues such as 'fish exports, domestic food security and the health of coastal communities' could provide for meaningful inter-departmental interactions. This process could help raise participants' awareness of the cross-sector linkages that underpin any policy building process.

Monitoring, control and surveillance against IUU *(National/Regional)*

Illegal, Unreported and Unregulated (IUU) fishing is one of the significant reasons for the low availability of fish for domestic use in the coastal states of the ESA-IO countries. According to the 'Stop Illegal Fishing' initiative of the Partnership for African Fisheries of NEPAD, one out of every four fish in Africa is caught illegally. Greater efforts need to be taken to set up Monitoring, Control and Surveillance (MCS) initiatives.

Some of these MCS ventures need to be more decentralised, community-partnered and less dependent on hugely capital-intensive and centralised paraphernalia commonly associated with MCS projects.

Savings and credit for fishers and fish workers *(National)*

Access to adequate credit at moderate costs will be a boon to fishers and fish workers in most countries. Most often, the major barrier for men and women to making a self-reliant living is just a matter of not having US $200 or $300 worth of equipment for fishing; a bicycle for transporting fish; a rack for drying fish; or capital to buy fish directly at the landing sites. This need prompts the concepts of entrepreneurial self-help groups; neighbourhood associations; self-employed women's initiatives etc. which start by individual savings (piggy-bank approach), later pooled and lent out to individuals on a lottery basis. When compared to traditional micro-finance programs, where funds tend to flow largely into consumptive purposes making repayments difficult, linking a micro-loan scheme to such collective saving initiatives provides greater scope for success. Assisting extension workers of fisheries and agriculture departments to initiate such ventures, after providing them with the proper training, will give a boost to self-reliant livelihood ventures. These initiatives can greatly enhance the food security of the participants, since it is well known that poorer communities spend more on food, as incomes increase.

People oriented technology cooperation programs *(National)*

There are likely to be numerous small but innovative discoveries (products, processes) being made in the ESA-IO countries by working people in the course of making a livelihood. Such initiatives are rarely recognised in the public sphere. They remain the 'Eureka's of the weak". These are never giant leaps in product development or knowledge production. However, these initiatives are based on local resources, require only resourcefulness and industrious effort, are easy to replicate and risk averse. Examples include: small developments in fishing gear design which reduce by-catch; changes in fish drying processes which reduce wastage; new materials for fabricating packaging containers which improve the shelf-life of a fish product and such like. Identifying such initiatives, documenting them and arranging for exchange programs between these rural-based persons/groups will foster a very good uptake of ideas and a much higher diffusion rate of innovations.

Training and equipment to become fishers *(National)*

In the aquatic-agriculture systems which prevail in many of the countries, foraging for fish is a seasonal livelihood option. However, if such individuals are provided with basic fishing knowledge and simple equipment they can greatly enhance their food security context and also earn some extra income in times of the agriculture slack season. For such training, the people-oriented TCP option will be more cost-effective and sustainable.

Public hearing on potentials and constraints for developing aquaculture systems *(National)*

The scope for increasing fish production by introducing aquaculture has been voiced in many of the policy documents of the ESO-IO region countries. However, aquaculture, in whatever form, is no remedy for solving food security issues. It is at best a supplementary technology for producing food and comes with a very wide range of possibilities which are applicable in different aquatic and aquatic-agriculture systems in the region. *Prima facie*, given the variety of water bodies in the region, the potential for aquaculture seems bright. Yet there are also many constraints – ecological, economic and even socio-cultural. There are numerous stakeholders with different interests – some who are pushing and others who are being cautious -- about the process of aquaculture development. Organising a series of public hearings in different countries, structuring the possibility for different interest groups to express their views on the same platform, will provide a good occasion to listen and understand the challenges of useful aquaculture for making more fish available for contributing to food security.

Maximising water productivity *(National)*

There is a Kampuchean proverb that states, "Where there is water, there is fish. Take care of the water and the fish will take care of you". The large number of small water bodies, particularly those that are man-made in countries like Zimbabwe, are sites where this proverb can be given its African rendition. Stocking water bodies with small indigenous species, in the form of polyculture, with other larger (naturally existing or introduced) species like perch, carp and prawns etc. could significantly contribute to the supply of micronutrient rich fish. Such preliminary efforts at raising stock densities could be a precursor to more organised and semi-intensive aquaculture initiatives.

Aquaculture adapted to sub-Saharan society *(Regional)*

Aquaculture is not a cure for hunger. Any attempt to portray it so in the sub-Saharan context is suspect. It needs to be viewed as a complementary technology for producing food. Aquaculture must be seen in the context of: (1) national development goals; (2) its relationship to other sources of both animal and vegetable protein currently available in the country; (3) the physical, biological and socio-economic environments into which its introduction is proposed; (4) its capacity for integration with existing or potential resource use practices, especially farming.

The local availability of species suitable for culture is key to successful aquaculture. Indigenous species are preferable, but higher-yielding exotic breeds are commonly introduced. Exotic breeds however have drawbacks. When such fish escape from their milieu, feral populations may threaten indigenous genetic resources, disrupt natural habitats or inadvertently introduce pathogens, predators and pests.

A position paper on the wide-ranging issues with regard to aquaculture should be prepared, including inputs from major institutions such as WorldFish and other major funding agencies that see a bright future for aquaculture as a source of fish for food security in sub-Saharan Africa.

Emphasis on small-scale fisheries to solve food insecurity of fish producers *(Regional)*

It is a cruel paradox that food producers are often the most food insecure. This seems to be true of fishers in the ESA-IO region and is highlighted by many policy documents reviewed for this assessment. Poverty in fishing communities is well known. Since fishers cannot live off fish alone, they must enter into market or barter transactions in order to get the food supplies necessary for their diets. Low productivity and unfavourable exchange entitlements are the root cause of poverty for fishers and fish workers and the consequent inability for many of them to achieve minimum standards of food intake and food security.

A fair part of the solution to this paradox lies in exhibiting a bias in policy-making favouring the small-scale sector in harvesting, processing and marketing of fish. In most of the large ESA-IO countries, support for sectors of the economy which are more labour-absorbing and rural-oriented, makes perfect economic, social, ecological and cultural sense. There is certainly a place in many of the smaller IO countries for technology-intensive, urban-oriented, private sector led initiatives in fishery related activities. This would be appropriate for export-oriented activities and relevant to those catering to domestic urban consumers. Replicating this model in the ESA-IO region would not be advisable since the bulk of those who are food insecure are the small fish producers and needy fish consumers in the rural hinterland.

Data and information on small-scale fisheries *(National/Regional)*

The small-scale fishery sector, whether harvesting, processing or distribution, plays an important role in all the 20 countries of the study. There is a dearth of data and information about the most basic parameters such as the number of people involved in the different activities; their gender; their share in the overall activities; whether their involvement is full- or part-time; their other activities; their spatial location etc. Despite this one confirmed fact is that small-scale fisheries' contribution to food security is paramount in all countries.

It may be appropriate to undertake a study to assess the nature of data and information which currently exists and knowledge gaps from the Fisheries Departments, Fishery Research Organisations, fisheries studies in Universities, etc. This could then be followed up by a data and information assessment, in any one of the countries, where there is a concentration of small-scale sector activity.

Close collaboration with local authorities and academics, as well as contact with fisher organisations, trade associations and NGOs should be a pre-requisite for success in undertaking investigations which comply with local cultural norms and values. The example of the Nigerian Local Government Area (LGA) Geodemographic Classification System and Profiler (http://nigerianlgaclassification.com) shows the potential and the power of garnering such information. In the context of the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries, currently being negotiated by FAO/UN, to start bridging this data gap in the ESA-IO region could attract support.

Fish powder for school meals *(National/Regional)*

The WFP school meals scheme, which is implemented in many of the countries, could be a good entry point for introducing fish powder (fish protein concentrates) as an additive in standard school meals. This would help wean children onto fish diets in a socialised context outside their homes. Studies on the feasibility of converting some of the small pelagic fish of the ESO-IO region into consumable products with a longer shelf life are encouraging. Collaboration with WFP could provide a large market for such products and could be seen as an incentive for private sector entrepreneurs, who have a social commitment, to venture into the mass production of such socially-desirable commodities. Some form of public-private partnerships between quasi-state agencies (e.g. the health and nutrition departments) and private investors (e.g. small-scale food processing units) may be in order to kick start such a program which would have high social returns if successful. An investigation into the possibility of such a program in those countries bordering Lake Victoria could be a rewarding initiative.

Extension services and media *(National)*

Governmental extension services, particularly in the realm of health and family welfare, are an important channel for creating awareness about the role of fish in food and nutritional security. The focus of attention for these services should be women, particularly mothers. Since the level of literacy among women is reasonably high, the written word as a means for awareness creation may be used effectively. Special radio programs, SMS alerts through the mobile phone networks or TV spots using well known stars to anchor a social advertisement might be more effective in spreading the message about the benefits of eating more fish. Where fish consumption is not high, emphasis on its food and nutritional value for children could also be an important focus.

Regulations for diversion of fish for non-food use *(National)*

There is an increasing trend of fish being diverted for non-food uses in the ESO-IO region. This tendency needs to be observed and monitored. In a context where the purchasing power of poor people is declining, a context where pets of the more wealthy citizens and stall-fed livestock exercise greater market power over fish could evolve. In the current context of under-nutrition and mal-nutrition among vast sections of the population in ESA-IO countries, such a situation is both economically and ethically untenable since it would undermine the food security of needy humans.

Regulatory measures that prescribe the species and quantity of fish that could be used for such purposes need to be put in place as part of a national food policy. Public debate and support for such policy measures that would help divert more fish for human consumption is vital.

Post- harvest losses reduction *(National/Regional)*

Post-harvest losses of fish and aquatic products in the ESA-IO region have been estimated at 20-25 percent of the current production. Every small savings made is a potential contribution to enhancing food security. There are a variety of factors, which account for such loss. They are importantly related to the overall low level of infrastructure development for perishables such as fish: ice, cold storage facilities, and good roads, as well as the lack of awareness for simple preventive measures to reduce product quality deterioration. Given the erratic supply and high demand for fish, there is also very little consumer resistance to purchasing poor quality fish products; hence there is little incentive for sellers to improve quality. Reducing post-harvest losses must therefore be fostered by both consumer education, e.g. provision of hygiene awareness, and quality improvement facilities, e.g. fish storage, to fish processors/sellers.

Better urban fish markets *(National/Regional)*

Setting up cleaner and more accessible urban fish markets would help expand the consumption of all varieties of fish among more well-to-do consumers. The downstream impact of this would be better returns for both fish producers and fish sellers. This would have a broad impact on food security: direct for urban consumers and indirect for fishers and sellers.

Labour intensive, low fuel using transport alternatives *(National/Regional)*

Much of the food commodities in the ESA-IO region are carried from the production site to a first point of transport by person. The energy and time spent for this by men, and more importantly by women, has been and still is one of the main constraints to increasing agriculture and fishery productivity. The mere introduction of sturdy bicycles with a load carrier attachment and other types of animal drawn or human/fuel driven carts could transform market access. It could improve product quality delivered to consumers and greatly expand the market for perishable products such as fish. The direct and indirect food security implications of this expansion of physical accessibility of fish in countries where the road infrastructure is not well developed are bound to be significant. Some international development agencies have been supporting such initiatives, however more still needs to be done.

Promoting fisher and fish worker organizations *(National/Regional)*

When people are united in action they are able to achieve far more than if they act individually. Associations, cooperatives, trade unions, welfare organisations, and a whole host of other kinds of groups, which foster collective action, provide good platforms, which can demand greater actions for food and nutritional security.

They are also able to channel, more effectively, any programs and projects that cater to fulfilling this need. Encouraging the promotion of fisher and fish worker organisations as a policy perspective for the countries of the ESA-IO region would be a positive step to ensure that the benefits of development initiatives reach the beneficiaries.

Earmarking revenues from fish export for the welfare of fishing communities *(National)*

Fish is a major foreign exchange earner in many of the ESA-IO countries. These revenues go into the general financial pool of the concerned country. They get utilised in numerous ways and means for development activities based on food imports, fuel, capital goods and services or for directly funding domestic economic and social activities.

In most of the developing countries, where fish and fishery products constitute an important part of the export basket, it is also observed that fishers and fish workers continue to be poor, marginalised and often live in unhygienic locations. The trade-related infrastructure (landing sites, freezing plants, etc.) are generally upgraded to meet international HACCP standards, but livelihood-related infrastructure of the fishers in the vicinity nearby leave a lot to be desired. This dichotomy, if meaningfully addressed would contribute to the food security of the fishers in the country and greater food safety for the consumer in international markets.

Financial protocols that earmark a small share of earnings from fish exports to address welfare issues should become part of policy considerations in the ESA-IO region. Expert discussions with international banks and development agencies; national finance; commerce and fisheries department policy makers; to explore the feasibility of such measures need to be considered.

Annex 3. Qualitative and quantitative dimensions of integrating fisheries and aquaculture in the ESA-IO region

Burundi

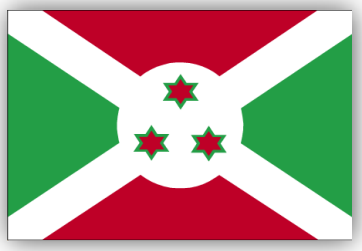
Comoros

Democratic Republic of the Congo

Djibouti

Eritrea

Ethiopia



BURUNDI

Burundi Country Indicators

Indicators	Value	
GDP in real terms (year 2000 USD million)	966.5	2010
GDP in nominal terms (USD million)	1,610.50	2010
Land area (km^2)	25,680.00	
Length of coastline (km)	N/A	
Area of territorial waters (km^2)	N/A	
Continental shelf area (km^2)	N/A	
Area of the exclusive economic zone (EEZ) (km^2)	N/A	
Total population	8,382,849	2010
Population density (people/km^2)	326.4	2010
Population, female (% of total)	50.9	2010
Rural population (% of total population)	89	2010
Population ages 0-14 (% of total)	37.9	2010
Population living below poverty line (%)	66.9	2006
Number of fishers (includes aquaculture)	N/A	
People employed in fish processing and marketing	N/A	
Total employment in fisheries	120,000	2006
Fish trade/Food trade	0.40%	2010
Per capita fish consumption	2.19	2009
Fish imports (tonnes live weight)	1,630	2009
Fish exports (tonnes live weight)	11	2009
Main group of species consumed in the country	Freshwater and diadromous fish	2009
Share of fish in animal protein	17.2	2007
Share of fish in total protein	1.2	2007
Literacy rate, adult female (% of females ages 15 and above)	60.9	2009
Literacy rate, adult male (% of males ages 15 and above)	72.6	2009
Literacy rate, adult total (% of people ages 15 and above)	66.6	2009
Mortality rate, infant (per 1,000 live births)	87.8	2010
Mortality rate, under 5 (per 1,000)	141.9	2010
People living with HIV/AIDS, total	180,000	2009
Malnutrition prevalence, weight for age (% under age 5)	38.9	2000
Malnutrition prevalence, height for age (% under age 5)	631	2000
Telephone subscribers (%)	10.5	2009/10
Mobile-phone subscribers (%)	10.1	2009/10
Internet users (%)	0.8	2009/10
GEF benefits index for biodiversity (0 = no biodiversity potential to 100 = maximum)	0.3	2008
United Nations Development Programme (UNDP) Environmental Performance Index	43.9	2010

Burundi Qualitative Dimensions

Four recent documents were examined to assess the extent of fisheries and aquaculture integration into food security policies and plans for Burundi. These were:

Documents:

1. The United Nations Integrated Support Strategy in Burundi, 2010-2014;
2. Global Agriculture and Food Security Program (2012);
3. FAO NMTPF Burundi, 2010-2014;
4. PNSA, 2009-2015.

The **United Nations Integrated Support Strategy in Burundi** has no reference to fisheries.

The **Global Agriculture and Food Security Program** has no reference to fisheries.

In the **FAO NMTPF**, one of the five priority areas is the promotion of rural entrepreneurship for the valorisation and marketing of agricultural and fishery products. The contribution of fisheries to the GDP is assessed as marginal, but aquaculture is noted to have important growth potential. There is no reference to the contribution to food security. Some of the results to be obtained by the NMTPF are to assure and increase the quality of fishery products traded, and to make fishery products available in the country.

The overall objective under the **PNSA**, is to re-establish food self-sufficiency and to improve the population's nutrition, with the goal of reducing hunger and malnutrition by 50 percent by 2015. One of the specific objectives is to increase the production of fish products by introducing new technologies and adapted skills. Under the sub-programme for sustainable food security, one of the four components is the development of fisheries. The promotion of fisheries and aquaculture is listed as one of the strategic elements for food security by 2015. To achieve the proposed goals the required annual average growth rate for fishery products is 15 percent. The contribution of the fisheries sector to the national economy is again estimated as marginal and the productive potential of the Lake Tanganyika, the origin of 99 percent of fish, is given as under-exploited. Between 1998 and 2006, the average annual supply of animal products per inhabitant is estimated at 12.1 kg, and fish accounted for 19 percent. Household access to meat or fish is reduced. The total cost of the fisheries and aquaculture component of the PNSA is estimated at US $25.3 million (USD 21.4 million for fisheries and USD 3.9 million for aquaculture).

Burundi Quantitative Dimensions

Factors to be considered to assess the role of fish in food and nutritional security	Data & time points	Favorable	Adverse	No data available
Availibility				
Total fish production (marine + inland + aquaculture)	2009-2004	Increasing		
Total physical availability for consumption [total production + imports - exports (in live weight)]	2009-2004	Increasing		
The 'apparent consumption' of fish per capita	2009-2004	Increasing		
Share of small-scale fishers production to the total fish production			Low	
Area of land covered by small-scale aquaculture (back yard ponds etc)				
Share of fish imported specifically for local consumption (processed or fresh)	2009	High		
Availability of fish marketing infrastructure in urban and rural areas				
Availability of ice and cold storage facilities				
Accessibility				
Per-capita income (GDP/pop)	2011-2010	Increasing		
General consumer price index	2011-2010		Increasing	
Fish prices compared to other animal protein prices				
Poverty levels and percentage of population below these levels	2006		High	
Unemployment levels				
Utilisation				
Access to safe water	2008-2000	Increasing		
Infant mortality levels	2009-2000	Decreasing		
Access to sanitation	2010-2000	Increasing		
Stability				
Female literacy	2009-2008	Increasing		
Mention of fish in nutrition education/awareness programs and literature			Absent	
Publicity about fish consumption in mass media (newspaper, radio, TV, SMS, etc.)			Absent	

COMOROS

Comoros Country Indicators

Indicators	Value	
GDP in real terms (year 2000 USD million)	247.2	2010
GDP in nominal terms (USD million)	541.1	2010
Land area (km^2)	1,861.00	
Length of coastline (km)	340	
Area of territorial waters (km^2)	7,480.00	
Continental shelf area (km^2)	1,526.00	
Area of the exclusive economic zone (EEZ) (km^2)	163,752.00	
Total population	734,750	2010
Population density (people/km^2)	394.8	2010
Population, female (% of total)	49.6	2010
Rural population (% of total population)	71.8	2010
Population ages 0-14 (% of total)	42.6	2010
Population living below poverty line (%)	44.9	2004
Number of fishers (includes aquaculture)	8,500	1999
People employed in fish processing and marketing	24,000	1999
Total employment in fisheries	32,500	1999
Fish trade/Food trade	2.90%	2010
Per capita fish consumption	22.99	2009
Fish imports (tonnes live weight)	462.3	2009
Fish exports (tonnes live weight)	N/A	2009
Main group of species consumed in the country	Pelagic fish	2009
Share of fish in animal protein	56.3	2007
Share of fish in total protein	15	2007
Literacy rate, adult female (% of females ages 15 and above)	68.7	2009
Literacy rate, adult male (% of males ages 15 and above)	79.7	2009
Literacy rate, adult total (% of people ages 15 and above)	74.2	2009
Mortality rate, infant (per 1,000 live births)	62.8	2010
Mortality rate, under 5 (per 1,000)	85.6	2010
People living with HIV/AIDS, total	500	2009
Malnutrition prevalence, weight for age (% under age 5)	25	2000
Malnutrition prevalence, height for age (% under age 5)	46.9	2000
Telephone subscribers (%)	19	2009/10
Mobile-phone subscribers (%)	15.2	2009/10
Internet users (%)	3.7	2009/10
GEF benefits index for biodiversity (0 = no biodiversity potential to 100 = maximum)	2.3	2008
United Nations Development Programme (UNDP) Environmental Performance Index	N/A	2010

Comoros Qualitative Dimensions

Two recent documents were examined to assess the extent of integration of fisheries and aquaculture into the food security policies and plans of Comoros. These were:

Documents:

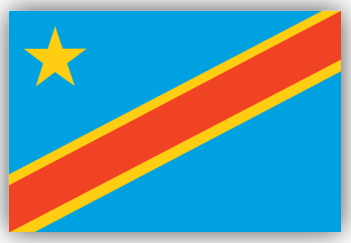
1. The United Nations Development Assistance Framework (UNDAF), 2008-2012;
2. Comprehensive Food Security and Vulnerability Analysis (2006).

To achieve the goal of improving the incomes, employment and food security of poor households, one of the specific programmes in the **United Nations Development Assistance Framework** (UNDAF), is to exploit Comoros' potential in the fisheries sector to benefit food security. Fisheries are considered a growth sector, although fisher men and women are included as one of the vulnerable population groups. Activities for sustainable resource exploitation and labelling of products are mentioned. There is no analysis of the contribution of fish to food security in the country.

The **Comprehensive Food Security and Vulnerability Analysis** notes that fishing is one of the four main activities in which households participate. It estimates that agriculture and fishing account for more than 40 percent of the country's GDP. Fisheries employ an estimated 6 percent of the working population. Estimates are that there are about 8,500 professional fishermen and 24,000 people employed in the fish processing industry. Fishing is one of the livelihoods most vulnerable to transitory food insecurity given the seasonality of catches. Food security is assessed in the country as an issue of access to food. Fishing is a relevant activity for all islands of the country, and while some households use fisheries as their only means of subsistence it is carried out in conjunction with agriculture, being a small-scale activity without large commercial fishing fleets. One of the issues that limits production is the lack of storage and processing facilities. Meat, fish and rice are the food items most frequently lacking in daily diets, according to the report. Protein consumption is below acceptable levels, and 50 percent of animal proteins come from imported food. There is a deficit in the production of animal proteins on the three islands, although fish production in Mohéli and Grand Comore largely make up for these deficits. Households depending exclusively or primarily on fishing are among the most vulnerable to chronic food insecurity, and fishing families were identified by UNDP as one of the main groups with poor food security outcomes. Migration from the other two islands to Mohéli (the least food insecure) is likely to increase its vulnerability to food insecurity due to higher demand for arable land and an increased access to fishing areas.

Comoros Quantitative Dimensions

Factors to be considered to assess the role of fish in food and nutritional security	Data & time points	Favorable	Adverse	No data available
Availibility				
Total fish production (marine + inland + aquaculture)	2009-2004	Increasing		
Total physical availability for consumption [total production + imports - exports (in live weight)]	2009-2004	Increasing		
The 'apparent consumption' of fish per capita	2009-2004		Decreasing	
Share of small-scale fishers production to the total fish production	2003		Low	
Area of land covered by small-scale aquaculture (back yard ponds etc)	2003			
Share of industrial fishery catch which is (processed and) sold locally	2003		Low	
Share of fish imported specifically for local consumption (processed or fresh)	2009	High		
Availability of fish marketing infrastructure in urban and rural areas				
Availability of ice and cold storage facilities				
Roads from coast to inland areas				
Accessibility				
Per-capita income (GDP/pop)	2011-2010		Decreasing	
General consumer price index	2011-2010		Increasing	
Fish prices compared to other animal protein prices				
Poverty levels and percentage of population below these levels	2006		High	
Unemployment levels				
Utilisation				
Access to safe water	2008-2000	Increasing		
Infant mortality levels	2009-2000	Decreasing		
Access to sanitation	2010-2000	Increasing		
Stability				
Female literacy	2009-2008		Decreasing	
Mention of fish in nutrition education/awareness programs and literature			Absent	
Publicity about fish consumption in mass media (newspaper, radio, TV, SMS, etc.)		Present		



Democratic Republic of the Congo

Democratic Republic of Congo Country Indicators

Indicators	Value	
GDP in real terms (year 2000 USD million)	6,850.70	2010
GDP in nominal terms (USD million)	13,145.10	2010
Land area (km^2)	2,267,050.00	
Length of coastline (km)	37	
Area of territorial waters (km^2)	814	
Continental shelf area (km^2)	1 ,593.0	
Area of the exclusive economic zone (EEZ) (km^2)	1,606.00	
Total population	65,965,795	2010
Population density (people/km^2)	29.1	2010
Population, female (% of total)	50.3	2010
Rural population (% of total population)	64.8	2010
Population ages 0-14 (% of total)	46.3	2010
Population living below poverty line (%)	71	2006
Number of fishers (includes aquaculture)	153,432	2006
People employed in fish processing and marketing	500,000	2006
Total employment in fisheries	653,432	2006
Fish trade/Food trade	2.90%	2010
Per capita fish consumption	5.07	2009
Fish imports (tonnes live weight)	86,777.60	2009
Fish exports (tonnes live weight)	162.1	2009
Main group of species consumed in the country	Freshwater and diadromous fish	2009
Share of fish in animal protein	41.6	2007
Share of fish in total protein	6.6	2007
Literacy rate, adult female (% of females ages 15 and above)	54.9	2009
Literacy rate, adult male (% of males ages 15 and above)	79.5	2009
Literacy rate, adult total (% of people ages 15 and above)	67	2009
Mortality rate, infant (per 1,000 live births)	111.7	2010
Mortality rate, under 5 (per 1,000)	169.9	2010
People living with HIV/AIDS, total	495,000	2009
Malnutrition prevalence, weight for age (% under age 5)	28.2	2007
Malnutrition prevalence, height for age (% under age 5)	45.8	2007
Telephone subscribers (%)	15.5	2009/10
Mobile-phone subscribers (%)	15.4	2009/10
Internet users (%)	0.6	2009/10
GEF benefits index for biodiversity (0 = no biodiversity potential to 100 = maximum)	19.9	2008
United Nations Development Programme (UNDP) Environmental Performance Index	51.6	2010

Democratic Republic of Congo Qualitative Dimensions

Two recent documents were examined to assess the extent of integration of fisheries and aquaculture into the food security policies and plans of the Democratic Republic of Congo. These are:

Documents:

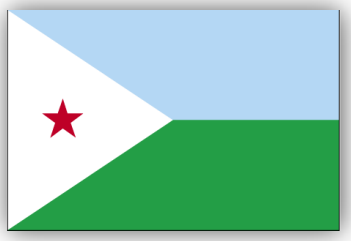
1. Country Assistance Framework and the United Nations Development Assistance Framework (UNDAF), 2008-2012;
2. FAO NMTPF, 2011-2015.

The **Country Assistance Framework and the United Nations Development Assistance Framework** document make no reference to the impact of fisheries on food security. It notes that the country's agricultural potential has never been met and that inland fisheries could yield an annual production of 700,000 tonnes.

In the **FAO NMTPF**, fisheries is analysed as a separate sub-sector of the agriculture and rural sector. Total fishing potential is estimated at 707,000 tonnes per year, while present production is 220,000 tonnes, resulting in an annual supply of 5.2 kg. Mainly artisanal fisheries accounted for the majority of the catches. The agriculture sector employs nearly 80 percent of the population and accounts for 40 percent of national GDP. Fisheries and aquaculture represent 12 percent of the agricultural GDP (nearly 5 percent of national GDP). It is estimated that nearly 75 percent of the population suffer from malnutrition. The document divides the country into five regions considering the productive potential, the population density and the access to markets. It identifies sectors to develop. Fisheries and aquaculture are included in three of the five regions. The document refers to the Country Assessment Framework, which despite being a coherent analysis of the country situation it omits fisheries, a relevant sector given its contribution to national economy (above livestock) and important source of animal proteins. The NPMTF estimates a budget of US $37.5 million for the period 2011-2015 for the FAO priority area of management and sustainable exploitation of fisheries and aquaculture resources.

Democratic Republic of Congo Quantitative Dimensions

Factors to be considered to assess the role of fish in food and nutritional security	Data & time points	Favorable	Adverse	No data available
Availibility				
Total fish production (marine + inland + aquaculture)	2009-2004		Decreasing	
Total physical availability for consumption [total production + imports - exports (in live weight)]	2009-2004		Decreasing	
The 'apparent consumption' of fish per capita	2009-2004		Decreasing	
Share of small-scale fishers production to the total fish production	2006	High		
Area of land covered by small-scale aquaculture (back yard ponds etc)				
Share of industrial fishery catch which is (processed and) sold locally				
Share of fish imported specifically for local consumption (processed or fresh)	2009	High		
Availability of fish marketing infrastructure in urban and rural areas				
Availability of ice and cold storage facilities				
Roads from coast to inland areas				
Accessibility				
Per-capita income (GDP/pop)	2011-2010	Increasing		
General consumer price index	2011-2010		Increasing	
Fish prices compared to other animal protein prices				
Poverty levels and percentage of population below these levels	2006		High	
Unemployment levels				
Utilisation				
Access to safe water	2008-2000	Increasing		
Infant mortality levels	2009		High	
Access to sanitation	2010-2000	Increasing		
Stability				
Female literacy	2009-2008	Increasing		
Mention of fish in nutrition education/awareness programs and literature			Absent	
Publicity about fish consumption in mass media (newspaper, radio, TV, SMS, etc.)			Absent	



DJIBOUTI

Djibouti Country Indicators

Indicators	Value	
GDP in real terms (year 2000 USD million)	743.6	2010
GDP in nominal terms (USD million)	982.5	2010
Land area (km^2)	23,180.00	
Length of coastline (km)	314	
Area of territorial waters (km^2)	6,908.00	
Continental shelf area (km^2)	3,187.00	
Area of the exclusive economic zone (EEZ) (km^2)	7,459.00	
Total population	888 716	2010
Population density (people/km^2)	38.3	2010
Population, female (% of total)	50	2010
Rural population (% of total population)	11.9	2010
Population ages 0-14 (% of total)	35.8	2010
Population living below poverty line (%)	42	2007
Number of fishers (includes aquaculture)	700	2001
People employed in fish processing and marketing	1,300	2001
Total employment in fisheries	2,000	2001
Fish trade/Food trade	0.90%	2010
Per capita fish consumption	1.56	2009
Fish imports (tonnes live weight)	1,119.70	2009
Fish exports (tonnes live weight)	20.7	2009
Main group of species consumed in the country	Pelagic fish	2009
Share of fish in animal protein	2.2	2007
Share of fish in total protein	0.8	2007
Literacy rate, adult female (% of females ages 15 and above)	N/A	2009
Literacy rate, adult male (% of males ages 15 and above)	N/A	2009
Literacy rate, adult total (% of people ages 15 and above)	N/A	2009
Mortality rate, infant (per 1,000 live births)	73	2010
Mortality rate, under 5 (per 1,000)	91.1	2010
People living with HIV/AIDS, total	14,000	2009
Malnutrition prevalence, weight for age (% under age 5)	29.6	2006
Malnutrition prevalence, height for age (% under age 5)	32.6	2006
Telephone subscribers (%)	16.8	2009/10
Mobile-phone subscribers (%)	14.9	2009/10
Internet users (%)	3	2009/10
GEF benefits index for biodiversity (0 = no biodiversity potential to 100 = maximum)	0.5	2008
United Nations Development Programme (UNDP) Environmental Performance Index	60.5	2010

Djibouti Qualitative Dimensions

Four recent documents were examined to assess the extent of integration of fisheries and aquaculture into the food security policies and plans of Djibouti. These were:

Documents:

1. United Nations Development Assistance Framework (UNDAF), 2013-2017;
2. FAO *Cadre de Programmation pour Djibouti* (CPF), 2013-2017;
3. PNSA and *Plan d'Action dans le Secteur Primaire,* Executive Summary;
4. PNSA and *Plan d'Action dans le Secteur Primaire*, Presentation notes.

The **UNDAF** states that the lack of fisheries tradition is a major factor that contributes to the persistence of food insecurity in the country. One of the goals for the transformation of Djibouti by 2015 is the development of artisanal fisheries, which falls under food security and rural development, and within the strategy to reduce poverty and vulnerability. Fisheries activities and expected results are included along with the other agricultural sectors. Most of the results are included under the elaboration of policies, programmes and projects for local economic development, for which USD 7.61 million are allocated.

The **CPF** includes promotion of fish consumption in order to improve food security, along with support for institutional capacity and fisher associations, the CPF maintains a vision that fisheries are a source of wealth generation and are part of the agricultural sector, inclusive of factors such as gender, climate and environment. Capture fisheries sustainability is included as an expected result of the environmental component of the CPF. The economy of Djibouti is reliant on the tertiary sector and the primary sector is not capable of fulfilling food demands, whilst fish resources are assessed as under-exploited (estimated at one fifth of potential output). Fisheries are listed as one of the main sectors for international cooperation, and FAO activities are focused on marketing training and increasing the population's preference for consumption of fish products. The fisheries sector is considered an important potential source of economic development. The priority areas include support for strengthening institutions, management, technological innovation and raising awareness on the importance of fish consumption.

The ***Programme National de Sécurité Alimentaire*** (PNSA) ***et Plan d'Action dans le Secteur Primaire*** (PASP) could not be accessed, but the **Executive Summary** and the **Presentation Notes** were used to evaluate the role of fisheries. As part of the food security strategy, it was understood that transversal activities in the fisheries sector are being carried out. A specific project for the development of artisanal fisheries and another for the promotion of aquaculture were included in the PASP. One factor considered a constraint for the under-exploitation of fisheries resources is the population's lack of interest in working in the sector, as well as the low consumption of fish products (estimated at only 2 kg per capita per annum).

Projects will strengthen institutional capabilities, increase domestic production, promote consumption and assess the potential for aquaculture production. The budget allocated for each project is US $5.94 million and US $431,000 respectively.

Djibouti Quantitative Dimensions

Factors to be considered to assess the role of fish in food and nutritional security	Data & time points	Favorable	Adverse	No data available
Availibility				
Total fish production (marine + inland + aquaculture)	2009-2004	Increasing		
Total physical availability for consumption [total production + imports - exports (in live weight)]	2009-2004	Increasing		
The 'apparent consumption' of fish per capita	2009-2004	Increasing		
Share of small-scale fishers production to the total fish production	2002	High		
Area of land covered by small-scale aquaculture (back yard ponds etc)				
Share of industrial fishery catch which is (processed and) sold locally				
Share of fish imported specifically for local consumption (processed or fresh)	2009	High		
Availability of fish marketing infrastructure in urban and rural areas				
Availability of ice and cold storage facilities				
Roads from coast to inland areas				
Accessibility				
Per-capita income (GDP/pop)	2011-2010	Increasing		
General consumer price index	2011-2010		Increasing	
Fish prices compared to other animal protein prices				
Poverty levels and percentage of population below these levels	2007		Increasing	
Unemployment levels	2007		High	
Utilisation				
Access to safe water	2008-2000	Increasing		
Infant mortality levels	2009-2000	Decreasing		
Access to sanitation	2010-2000		Decreasing	
Stability				
Female literacy				
Mention of fish in nutrition education/awareness programs and literature			Absent	
Publicity about fish consumption in mass media (newspaper, radio, TV, SMS, etc.)			Absent	

ERITREA

Eritrea Country Indicators

Indicators	Value	
GDP in real terms (year 2000 USD million)	692.5	2010
GDP in nominal terms (USD million)	2,117.0	2010
Land area (km^2)	101,000.0	
Length of coastline (km)	2,234.0	
Area of territorial waters (km^2)	49,148.0	
Continental shelf area (km^2)	61,817.0	
Area of the exclusive economic zone (EEZ) (km^2)	77,728.0	
Total population	5,253,676	2010
Population density (people/km^2)	52.0	2010
Population, female (% of total)	50.7	2010
Rural population (% of total population)	78.4	2010
Population ages 0-14 (% of total)	41.6	2010
Population living below poverty line (%)	50.0	2004
Number of fishers (includes aquaculture)	3,500	2002
People employed in fish processing and marketing	10,000	2002
Total employment in fisheries	13,500	2002
Fish trade/food trade	0.7%	2010
Per capita fish consumption	0.36	2009
Fish imports (tonnes live weight)	137.0	2009
Fish exports (tonnes live weight)	351.0	2009
Main group of species consumed in the country	Demersal fish	2009
Share of fish in animal protein	2.3	2007
Share of fish in total protein	0.2	2007
Literacy rate, adult female (% of females ages 15 and above)	56.0	2009
Literacy rate, adult male (% of males ages 15 and above)	77.9	2009
Literacy rate, adult total (% of people ages 15 and above)	66.6	2009
Mortality rate, infant (per 1,000 live births)	42.3	2010
Mortality rate, under 5 (per 1,000)	60.8	2010
People living with HIV/AIDS, total	25,000	2009
Malnutrition prevalence, weight for age (% under age 5)	34.5	2002
Malnutrition prevalence, height for age (% under age 5)	43.7	2002
Telephone subscribers (%)	3.7	2009/10
Mobile-phone subscribers (%)	2.8	2009/10
Internet users (%)	4.9	2009/10
GEF benefits index for biodiversity (0 = no biodiversity potential to 100 = maximum)	0.8	2008
United Nations Development Programme (UNDP) Environmental Performance Index	54.6	2010

Eritrea Qualitative Dimensions

Three recent documents were examined to assess the extent of integration of fisheries and aquaculture into the food security policies and plans of Eritrea. These were:

Documents:

1. United Nations Development Assistance Framework (UNDAF), 2007-2011;
2. Food Security Strategy, (2004);
3. Fisheries Development Project, Project Design Report (2010).

The **UN Development Assistance Framework** does not refer to the relation between the food insecurity situation in the country and the fisheries sector. References to fisheries in the food security section are, as in many documents, general to many sectors. The proposed response of the UN system is to enhance the food security situation in the country. This includes increasing access of rural poor to finance in order to diversify their sources of income; and strengthening the Government's capacity to improve food security planning and the development of policies related to agriculture, fisheries and water resources. Management of natural resources is included as an integral part of the approach to address food insecurity, and the UN intends to support conservation of marine resources among other areas. Although not specific, some outcomes can be related to fisheries since one of the partners is the Ministry of Fisheries. Such is the case of the outcome 'Enhanced decision making on food security,' and outputs of the development and updating of strategies, policies, plans and projects, or development of regulatory procedures. The outcome "Improved access and availability of food,' with outputs of income generation activities and livelihoods, intended to support 10 percent of the poor through micro credit financing.

In the **Food Security Strategy** it is estimated that about 10 percent of all households' income are due to fisheries. The diversity on the dietary intake is evaluated as low, and the share for animal and fish products is reduced (6-7 percent). In order to ensure national and household food security the proposed strategy has three pillars: to increase agricultural and fisheries production; to enhance foreign exchange earnings through exports; and to use food assistance effectively. Under the first pillar, the fishing sector is has a high potential, given that it is not (it should be noted that the document dates back to 2004) overcapitalized and most of the stocks are not overfished, and some are considered underexploited. The strategic objectives, in order to achieve higher production in fisheries, are increased productivity of artisanal fisheries by strengthening cooperatives through technical assistance, and enhanced resource management and planning. The key element of the strategy is improved income for coastal villagers through higher productivity and stronger cooperatives, to enhance their food security. Specific measures to promote domestic fish processing and marketing by small-scale fishermen are expected.

The second pillar is to enhance the national capacity to import adequate quantities of food by increasing export earnings. It is expected that investments and institutional reforms create a positive environment to develop the fisheries sector and promote investments that allow for a more efficient exploitation of resources and increase exports of high value products, generating revenue to buy food.

There is particular reference to the promotion and protection of small-scale fishermen in order to assure that the increased industrialization and development of marine resources exploitation does not threaten household food security.

Since the **Project Design Report of the Fisheries Development Project** is focused on fisheries, the analysis looked at the contribution of fisheries to food security. The document notes that agriculture manages to produce only 60 percent of food requirements and that fisheries have the potential to contribute substantially to and diversify national food security. This would also reduce the incidence of poverty, particularly among coastal communities. Fish stocks were noted as being abundant and underexploited. The potential for freshwater and marine aquaculture was also noted, and as part of the overall effort to achieve food security and alleviate poverty, the government and FAO have developed a support plan for this sector. The goal of the project is to contribute to national and household food security and the alleviation of rural poverty, by raising production and productivity of artisanal fishers while conserving fishery and other marine resources. According to the report, the Eritrean Government acknowledges the importance of aquaculture in the national development plan and strategy, and aims to develop the sector as part of the overall effort to achieve food security and reduce poverty. The project has a budget of US $18.1 million, and will be implemented in regions of the country where there are poor agricultural factors that makes the region dependent on fishing for food security.

Eritrea Quantitative Dimensions

Factors to be considered to assess the role of fish in food and nutritional security	Data & time points	Favorable	Adverse	No data available
Availibility				
Total fish production (marine + inland + aquaculture)	2009-2004		Decreasing	
Total physical availability for consumption [total production + imports - exports (in live weight)]	2009-2004		Decreasing	
The 'apparent consumption' of fish per capita	2009-2004		Decreasing	
Share of small-scale fishers production to the total fish production	2002		High	
Area of land covered by small-scale aquaculture (back yard ponds etc)				
Share of industrial fishery catch which is (processed and) sold locally				
Share of fish imported specifically for local consumption (processed or fresh)	2009	High		
Availability of fish marketing infrastructure in urban and rural areas				
Availability of ice and cold storage facilities				
Roads from coast to inland areas				
Accessibility				
Per-capita income (GDP/pop)	2010-2009	Increasing		
General consumer price index	2011-2010		Increasing	
Fish prices compared to other animal protein prices				
Poverty levels and percentage of population below these levels	2004		High	
Unemployment levels				
Utilisation				
Access to safe water	2008-2000	Increasing		
Infant mortality levels	2009-2000	Decreasing		
Access to sanitation	2010-2000	High		
Stability				
Female literacy	2009-2006	Increasing		
Mention of fish in nutrition education/awareness programs and literature			Absent	
Publicity about fish consumption in mass media (newspaper, radio, TV, SMS, etc.)		Present		

ETHIOPIA

Ethiopia Country Indicators

Indicators	Value	
GDP in real terms (year 2000 USD million)	18,322.9	2010
GDP in nominal terms (USD million)	29,717.0	2010
Land area (km^2)	1,000,000.0	
Length of coastline (km)	N/A	
Area of territorial waters (km^2)	N/A	
Continental shelf area (km^2)	N/A	
Area of the exclusive economic zone (EEZ) (km^2)	N/A	
Total population	82,949,541	2010
Population density (people/km^2)	82.9	2010
Population, female (% of total)	50.2	2010
Rural population (% of total population)	82.4	2010
Population ages 0-14 (% of total)	41.5	2010
Population living below poverty line (%)	29.2	2009/2010
Number of fishers (includes aquaculture)	5,000	2001
People employed in fish processing and marketing	20,000	2001
Total employment in fisheries	25,000	2001
Fish trade/food trade	0.1%	2010
Per capita fish consumption	0.20	2009
Fish imports (tonnes live weight)	678.0	2009
Fish exports (tonnes live weight)	1,221.5	2009
Main group of species consumed in the country	Freshwater and diadromous fish	2009
Share of fish in animal protein	0.8	2007
Share of fish in total protein	0.1	2007
Literacy rate, adult female (% of females ages 15 and above)	N/A	
Literacy rate, adult male (% of males ages 15 and above)	N/A	
Literacy rate, adult total (% of people ages 15 and above)	N/A	
Mortality rate, infant (per 1,000 live births)	67.8	2010
Mortality rate, under 5 (per 1,000)	105.9	2010
People living with HIV/AIDS, total	N/A	
Malnutrition prevalence, weight for age (% under age 5)	34.6	2005
Malnutrition prevalence, height for age (% under age 5)	50.7	2005
Telephone subscribers (%)	6.0	2009/10
Mobile-phone subscribers (%)	4.9	2009/10
Internet users (%)	0.5	2009/10
GEF benefits index for biodiversity (0 = no biodiversity potential to 100 = maximum)	8.4	2008
United Nations Development Programme (UNDP) Environmental Performance Index	43.1	2010

Ethiopia Qualitative Dimensions

Six recent documents were examined to assess the extent of integration of fisheries and aquaculture into the food security policies and plans of Ethiopia. These were:

Documents:

1. Ethiopia's Agricultural Sector Policy and Investment Framework (PIF), 2010-2020;
2. Ethiopia's Agricultural Sector PIF 2010-2020 – Ten Year Road Map;
3. Water Sector Strategy (2001);
4. Growth and Transformation Plan, 2010/11-2014/15;
5. FAO Ethiopia Country Programming Framework, 2012-2015;
6. United Nations Development Assistance Framework (UNDAF), 2012-2015.

The **Agricultural Sector Policy and Investment Framework** aims to provide a strategic framework for the planning and prioritisation of investments for growth and development in Ethiopia's agricultural sector. It states that a broad definition of agriculture is used in the document, including 'all forms of agriculture, livestock, fisheries, forestry, irrigation and natural resource management.' Four strategic objectives are linked to one thematic area:

1. Productivity and production: to achieve a sustainable increase in agricultural productivity and production;
2. Rural commercialisation: to accelerate agricultural commercialization and agro-industrial development;
3. Natural resource degradation and improve productivity of natural resources;
4. Disaster risk management and food security: to achieve universal food security and protect vulnerable households from natural disasters.

When the document gives further details of the activities foreseen the focus is clearly on agriculture and livestock.

The sections dedicated to water resources management concentrate on agriculture and livestock uses of water, and does not refer to fish production (either capture or eventual aquaculture development). Conversely there are strategies presented for agriculture and livestock that could benefit fisheries and aquaculture. These are: the development of value chain efficiency; the reduction of post-harvest losses; improved infrastructure and market access; access to financial services; the development of commercial supply chain market information services; product standards; quality assurance systems; post-harvest storage and transport facilities.

Although the **Ten Year Road Map**, does not include specific analysis for fisheries, it acknowledges the importance of fisheries as a natural resource sub-sector and highlights the need to review its treatment in programme and in organisational settings. In the outline of proposed programs, the document includes natural resources and agriculture research activities and it highlights a fishery and aquaculture component.

One of the supporting documents of the PIF is the **Water Sector Strategy** (2001). This includes a component concerning the assessment, preservation and enrichment of aquatic resources in rivers and lakes, and incorporates aquatic resources development. In order to achieve these goals the document proposes:

- to conduct surveys to assess the existing state of aquatic resources development;
- take actions to develop and maintain the potential of aquaculture;
- enhance the development of capture fisheries in existing and future reservoirs;
- install fish breeding stations in the reservoirs to enhance fish production;
- investigate and develop rain water harvesting options in areas where there is scarcity of water resources for enrichment of aquatic resources.

When analyzing the use for irrigation, the strategy also proposes an integrated view for irrigation usage of water, ensuring complementary use and multi-purpose development between irrigation, power, livestock, fishery, tourism, recreation, etc.

The **Growth Transformation Plan** does not refer to fisheries and the food security components are included under the section dedicated to agriculture and rural development, without mentioning the contribution of fisheries to food security. However, some expected outcomes of the plan, such as the Ethiopian Commodity Exchange, could indirectly have a positive impact on the development of the fish trade in the country.

The **FAO Country Programming Framework** for Ethiopia sets out FAO's contributions to achieve the goals set by the Growth and Transformation Plan and the Agricultural Sector Policy and Investment Plan. The document identifies two core functions and three priority focus areas. The core functions are to boost the country's technical and institutional capacity in agricultural policy and regulatory framework, and agricultural information and knowledge management. The focus areas are: agricultural productivity and competitiveness; sustainable natural resources development and management; and improved food and nutrition security.

References to fisheries and aquaculture are included under the priority area 'Agriculture productivity and competitiveness,' with outcome "Livestock production and productivity improved", and output 'Fisheries and aquaculture development increased.'

According to this output, it is expected that through FAO's support the capacity for the transfer and adoption of proper technology in fishery and aquaculture will be strengthened, especially in parts of the country with rich water resources. It is also expected that fish production will increase in a sustainable and gender-sensitive manner, introducing appropriate technology that provides proper care for the existing lakes, and allows production of fish without threatening the balance of the fish population.

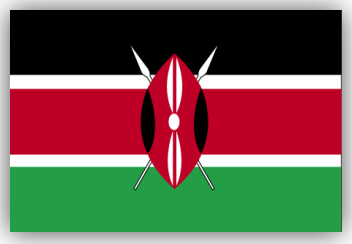
Under the same priority area as part of the outcome 'Crop production and productivity improved,' the expected output 'National phytosanitary system to meet the international requirements improved,' could be indirectly related to fisheries. The output expects to revise and upgrade the technical capacity for the regulation and enforcement of safety and phytosanitary systems. The output also includes the preparation of guidelines and manuals, as well as strengthening capacities to meet international of specific standards.

However, the priority area 'Improved food and nutrition security' does not consider the potential contribution of fisheries. In the set of indicators of the results matrix, there is no indicator for fisheries related outputs.

The **UN Development Assistance Framework** does not include any reference to fisheries or aquaculture.

Ethiopia Quantitative Dimensions

Factors to be considered to assess the role of fish in food and nutritional security	Data & time points	Favorable	Adverse	No data available
Availibility				
Total fish production (marine + inland + aquaculture)	2009-2004	Increasing		
Total physical availability for consumption [total production + imports - exports (in live weight)]	2009-2004	Increasing		
The 'apparent consumption' of fish per capita	2009-2004	Increasing		
Share of small-scale fishers production to the total fish production	2002	High		
Area of land covered by small-scale aquaculture (back yard ponds etc)				
Share of fish imported specifically for local consumption (processed or fresh)	2009	Increasing		
Availability of fish marketing infrastructure in urban and rural areas				
Availability of ice and cold storage facilities				
Accessibility				
Per-capita income (GDP/pop)	2011-2010	Increasing		
General consumer price index	2011-2010		Increasing	
Fish prices compared to other animal protein prices				
Poverty levels and percentage of population below these levels	2010		Increasing	
Unemployment levels	2009		High	
Utilisation				
Access to safe water	2008-2000	Increasing		
Infant mortality levels	2009-2000	Decreasing		
Access to sanitation	2010-2000	Increasing		
Stability				
Female literacy	2009		Low	
Mention of fish in nutrition education/awareness programs and literature			Absent	
Publicity about fish consumption in mass media (newspaper, radio, TV, SMS, etc.)			Absent	



KENYA

Kenya Country Indicators

Indicators	Value	
GDP in real terms (year 2000 USD million)	18,938.4	2010
GDP in nominal terms (USD million)	31,408.6	2010
Land area (km^2)	569,140.0	
Length of coastline (km)	536.0	
Area of territorial waters (km^2)	11,792.0	
Continental shelf area (km^2)	11,073.0	
Area of the exclusive economic zone (EEZ) (km^2)	116,942.0	
Total population	40,512,682	2010
Population density (people/km^2)	71.2	2010
Population, female (% of total)	50.1	2010
Rural population (% of total population)	77.8	2010
Population ages 0-14 (% of total)	42.5	2010
Population living below poverty line (%)	45.9	2005
Number of fishers (includes aquaculture)	63	2006
People employed in fish processing and marketing	800	2006
Total employment in fisheries	863	2006
Fish trade/food trade	2.9%	2010
Per capita fish consumption	3.36	2009
Fish imports (tonnes live weight)	12,794.0	2009
Fish exports (tonnes live weight)	24,452.9	2009
Main group of species consumed in the country	Freshwater and diadromous fish	2009
Share of fish in animal protein	5.7	2007
Share of fish in total protein	1.7	2007
Literacy rate, adult female (% of females ages 15 and above)	N/A	
Literacy rate, adult male (% of males ages 15 and above)	N/A	
Literacy rate, adult total (% of people ages 15 and above)	N/A	
Mortality rate, infant (per 1,000 live births)	55.1	2010
Mortality rate, under 5 (per 1,000)	84.7	2010
People living with HIV/AIDS, total	1,500,000	2009
Malnutrition prevalence, weight for age (% under age 5)	16.5	2009
Malnutrition prevalence, height for age (% under age 5)	35.2	2009
Telephone subscribers (%)	50.3	2009/10
Mobile-phone subscribers (%)	48.7	2009/10
Internet users (%)	10.0	2009/10
GEF benefits index for biodiversity (0 = no biodiversity potential to 100 = maximum)	8.8	2008
United Nations Development Programme (UNDP) Environmental Performance Index	51.4	2010

Kenya Qualitative Dimensions

The extent of integration of fisheries and aquaculture into the food security policies and plans of Kenya were assessed by examining four recent documents and a website. These are:

Documents:

1. United Nations Development Assistance Framework (UNDAF), 2009-2013;
2. NMTPF, 2009-2013;
3. National Oceans and Fisheries Policy, 2008;
4. The importance of Capture Fisheries in Food Security in Kenya (Global Fish Alliance, 2009);
5. Ministry of Fisheries website (www.fisheries.go.ke).

The **UN Development Assistance Framework** for Kenya recognizes fisheries as one of the main drivers of the country's economy, along with tourism, agriculture, water and energy. These sectors employ 80 percent of the population and are dependent on natural resources and the environment, which it states are rapidly deteriorating. Under the outcome 'Enhanced environmental management for economic growth with equitable access to energy services and response to climate change,' the conservation and sustainable use of biological resources and marine and coastal resource management are included as part of the major issues and challenges to be addressed. The document acknowledges the government's commitment to environmental management and sustainable development through new legislation, as well as the development of sector specific policies and strategies in wildlife, coastal and marine resources.

The **NMTPF** includes specific components related to fisheries and aquaculture. Within the analysis of 'Opportunities for increasing agricultural productivity and the FAO's role', the section dedicated to fisheries development mentions that the exclusive economic zone (EEZ) marine resources' potential is not fully exploited. It also refers to the acknowledgement in the National Fisheries Policy (NFP) of the contribution of the fishery industry to employment, food supply, income and foreign currency generation. The main constraints for fisheries development referred to by the NMTPF, from the NFP, are: the uncoordinated development approaches; the low investment in infrastructure and equipment; the over-exploitation in some water bodies; the under-utilization of the EEZ and the under-development of aquaculture.

Support for the sustainable development of fisheries resources through small-scale aquaculture and artisanal coastal and inland lake fisheries is included as part of the priority area 'Sustainable natural resources and environmental management'. The UNDAF has 'Agriculture productivity and competitiveness among smallholders improved' as one of the expected outcomes of UN activities in Kenya.

The NMTPF includes an output of increased productivity and value addition of crops, livestock, commercial insects and fisheries. Fishery-specific expected outputs are an improvement in the capacity for value addition, the capability to meet food safety regulations and the diversification of nutrition and livelihood sources for fishing communities; as well as enhanced aquaculture development through technical training, extension and marketing activities. In line with the UNDAF outcome 'Sustainable management of natural resources and environmental management enhanced', the NMTPF output can be considered as enhancing support for regulatory reforms and institutions to foster wider exploitation of EEZ's marine and freshwater resources, as well relating to several outputs concerned with the improvement and enhancement of institutional strength and capabilities under environmental management.

The **National Oceans and Fisheries Policy** highlights that the government recognizes the critical role of fisheries in food security, employment and general economic benefit. This has resulted in the creation of a Ministry of Fisheries Ministry. The potential of aquaculture to contribute to food security, poverty reduction, employment generation and reduced pressure on capture fisheries resources have also been acknowledged. The overall objective of the policy is to enhance the fisheries sectors' contribution to wealth creation, employment generation (especially for youth and women), food security and income generation. The policy also focuses on the promotion of fish consumption to increase food security, employment, income and foreign currency gains. One of the specific objectives is to enhance food supply and food security. Another goal is to achieve self-sufficiency in fish and an adequate supply for the domestic market at all times, with an emphasis in the nutritional importance of fish consumption.

The Global Fish Alliance prepared a report on **The Importance of Capture Fisheries in Food Security in Kenya**, which presents the contribution of fishery products to food security by supplying 11 percent of the average daily protein consumption, despite its low consumption levels. It also mentions that most of the fish production is destined for export markets. The contribution of fisheries to the national economy in 2005 was estimated at 27 percent of agricultural GDP, mainly through Lake Victoria fisheries. Employment generated by the fisheries sector, both directly and indirectly, was estimated at nearly one million jobs. The document also refers to the importance given to fisheries in national documents as a way of improving communities' livelihoods.

The **Ministry of Fisheries website** presents the following policy priorities and a strategy for poverty reduction:

Policy priorities

- Strengthening institutional, policy and legal framework;
- Sustainable utilization of fisheries resources;
- Sustainable aquaculture development;
- Promotion of fish safety and quality assurance, investment, value addition and marketing;
- Promotion of regional and international cooperation;
- Infrastructure and institutional capacity development;
- Promotion and coordination of fisheries research.

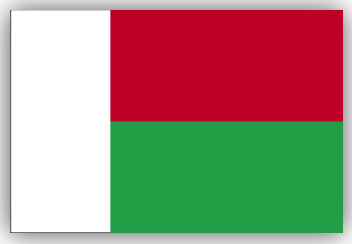
Poverty reduction strategy

Within the context of poverty alleviation and wealth creation, the policy priorities for fisheries are:

- Management, control and utilization of fisheries resources to support economic growth and to provide food security;
- Promotion of aquaculture development to increase fisheries resources base;
- Management and control of fish marketing systems to reduce post-harvest losses, assure quality and safety for the consumer, and ensure sustainability of local and export markets;
- Promotion of innovative saving schemes for the fishing community and community participation in resource management and infrastructure improvement.

Kenya Quantitative Dimensions

Factors to be considered to assess the role of fish in food and nutritional security	Data & time points	Favorable	Adverse	No data available
Availibility				
Total fish production (marine + inland + aquaculture)	2009-2004		Decreasing	
Total physical availability for consumption [total production + imports - exports (in live weight)]	2009-2004		Decreasing	
The 'apparent consumption' of fish per capita	2009-2004		Decreasing	
Share of small-scale fishers production to the total fish production	2007	High		
Area of land covered by small-scale aquaculture (back yard ponds etc)				
Share of industrial fishery catch which is (processed and) sold locally	2007		Low	
Share of fish imported specifically for local consumption (processed or fresh)	2009	High		
Availability of fish marketing infrastructure in urban and rural areas				
Availability of ice and cold storage facilities				
Roads from coast to inland areas				
Accessibility				
Per-capita income (GDP/pop)	2010-2009	Increasing		
General consumer price index	2011-2010		Increasing	
Fish prices compared to other animal protein prices				
Poverty levels and percentage of population below these levels	2005		High	
Unemployment levels	2005		High	
Utilisation				
Access to safe water	2008-2000	Increasing		
Infant mortality levels	2009-2000	Decreasing		
Access to sanitation	2010-2000	Increasing		
Stability				
Female literacy	2009-2008	Increasing		
Mention of fish in nutrition education/awareness programs and literature		Present		
Publicity about fish consumption in mass media (newspaper, radio, TV, SMS, etc.)		Present		



MADAGASCAR

Madagascar Country Indicators

Indicators	Value	
GDP in real terms (year 2000 USD million)	5,026.8	2010
GDP in nominal terms (USD million)	8,720.5	2010
Land area (km^2)	581,540.0	
Length of coastline (km)	4,828.0	
Area of territorial waters (km^2)	106,216.0	
Continental shelf area (km^2)	101,505.0	
Area of the exclusive economic zone (EEZ) (km^2)	1,225,259.0	
Total population	20,713,819	2010
Population density (people/km^2)	35.6	2010
Population, female (% of total)	50.2	2010
Rural population (% of total population)	69.8	2010
Population ages 0-14 (% of total)	43.1	2010
Population living below poverty line (%)	52.4	2005
Number of fishers (includes aquaculture)	193,370	2006
People employed in fish processing and marketing	3 000	2006
Total employment in fisheries	196,370	2006
Fish trade/food trade	24.7%	2010
Per capita fish consumption	6.84	2009
Fish imports (tonnes live weight)	26,060.8	2009
Fish exports (tonnes live weight)	44,775.6	2009
Main group of species consumed in the country	Marine fish, other	2009
Share of fish in animal protein	19.6	2007
Share of fish in total protein	4.5	2007
Literacy rate, adult female (% of females ages 15 and above)	N/A	
Literacy rate, adult male (% of males ages 15 and above)	N/A	
Literacy rate, adult total (% of people ages 15 and above)	N/A	
Mortality rate, infant (per 1,000 live births)	43.1	2010
Mortality rate, under 5 (per 1,000)	62.1	2010
People living with HIV/AIDS, total	24,000	2009
Malnutrition prevalence, weight for age (% under age 5)	36.8	2004
Malnutrition prevalence, height for age (% under age 5)	49.2	2009
Telephone subscribers (%)	31.5	2009/10
Mobile-phone subscribers (%)	30.6	2009/10
Internet users (%)	1.6	2009/10
GEF benefits index for biodiversity (0 = no biodiversity potential to 100 = maximum)	29.2	2008
United Nations Development Programme (UNDP) Environmental Performance Index	49.2	2010

Madagascar Qualitative Dimensions

Four documents were examined to assess the extent of integration of fisheries and aquaculture into the food security policies and plans of Madagascar. These were:

Documents:

1. The United Nations Development Assitance Framework (UNDAF), 2008-2011;
2. FAO NMTPF Madagascar, 2007-2010 (zero draft, 2006);
3. *Plan d'Action National Pour la Sécurité Alimentaire* (PANSA) (draft, 2005);
4. Comprehensive Food and Nutrition Security and Vulnerability Analysis (2010).

The **United Nations Development Assistance Framework** (UNDAF) highlights that the fisheries sector is one of the key sectors driving the economic growth. However, no further reference is made to fishing or aquaculture or their importance for food security.

Fisheries is analysed as a single sector in the ***FAO NMTPF Madagascar*** and one of the tasks assumed by the FAO was to update the fisheries and aquaculture director plan. Shrimp was mentioned as one of the country's main exports. However, the program designs appear to have a more general approach, with fisheries and aquaculture included within the agriculture sector. One of the policy priorities is the promotion of a policy of information and monitoring of the impact on food and nutritional security of the activities undertaken.

The ***Plan d'Action National Pour la Sécurité Alimentaire*** gives an overview of the food and nutrition security status in the country, and reference to fish is minor. Rice is the main food consumed, accounting for 50-55 percent of total calorie intake. Traditional fish products and aquaculture (along with other short production cycle livestock foods) are listed as the main source of proteins, but there is no estimation for the contribution of fish to the calorie or animal protein intake. Fisheries are included alongside other agriculture sectors, and their contribution to GDP for 2003 was estimated at 34 percent, shrimp being one of the main export products (11 percent of total exports in 2001).

The **Comprehensive Food and Nutrition Security and Vulnerability Analysis** looks at access to food from a household level. Fishermen are not mentioned given their small numbers (3 percent of total households, with an estimated 77 percent of their income generated by fisheries). When referring to food consumption, the survey concludes that the diet is based on rice, whilst vegetables and animal protein are rarely consumed (once and 2.3 times a week respectively). Fish is the most popular animal protein, with an average consumption of 1.3 days per week. The study also mentions several estimations for the consumption of different food products, including fish, for each region in the country.

Madagascar Quantitative Dimensions

Factors to be considered to assess the role of fish in food and nutritional security	Data & time points	Favorable	Adverse	No data available
Availibility				
Total fish production (marine + inland + aquaculture)	2009-2004	Increasing		
Total physical availability for consumption [total production + imports - exports (in live weight)]	2009-2004	Increasing		
The 'apparent consumption' of fish per capita	2009-2004	Increasing		
Share of small-scale fishers production to the total fish production	2008		High	
Area of land covered by small-scale aquaculture (back yard ponds etc)				
Share of industrial fishery catch which is (processed and) sold locally	2008			
Share of fish imported specifically for local consumption (processed or fresh)	2009	High		
Availability of fish marketing infrastructure in urban and rural areas				
Availability of ice and cold storage facilities				
Roads from coast to inland areas				
Accessibility				
Per-capita income (GDP/pop)	2010-2009		Decreasing	
General consumer price index	2011-2010		Increasing	
Fish prices compared to other animal protein prices				
Poverty levels and percentage of population below these levels	2005		High	
Unemployment levels	2005	Low		
Utilisation				
Access to safe water	2008-2000	Increasing		
Infant mortality levels	2009-2000	Decreasing		
Access to sanitation	2010-2000	Increasing		
Stability				
Female literacy	2009-2008		Decreasing	
Mention of fish in nutrition education/awareness programs and literature			Absent	
Publicity about fish consumption in mass media (newspaper, radio, TV, SMS, etc.)			Absent	

MALAWI

Malawi Country Indicators

Indicators	Value	
GDP in real terms (year 2000 USD million)	2,743.9	2010
GDP in nominal terms (USD million)	5,106.3	2010
Land area (km^2)	94,080.0	
Length of coastline (km)	N/A	
Area of territorial waters (km^2)	N/A	
Continental shelf area (km^2)	N/A	
Area of the exclusive economic zone (EEZ) (km^2)	N/A	
Total population	14,900,841	2010
Population density (people/km^2)	158.4	2010
Population, female (% of total)	50.0	2010
Rural population (% of total population)	80.2	2010
Population ages 0-14 (% of total)	45.8	2010
Population living below poverty line (%)	52.4	2004
Number of fishers (includes aquaculture)	62,000	2003
People employed in fish processing and marketing	350,000	2003
Total employment in fisheries	412,000	2003
Fish trade/food trade	0.5%	2010
Per capita fish consumption	4.98	2009
Fish imports (tonnes live weight)	4,024.9	2009
Fish exports (tonnes live weight)	60.0	2009
Main group of species consumed in the country	Freshwater and diadromous fish	2009
Share of fish in animal protein	33.1	2007
Share of fish in total protein	2.6	2007
Literacy rate, adult female (% of females ages 15 and above)	67.0	2009
Literacy rate, adult male (% of males ages 15 and above)	80.6	2009
Literacy rate, adult total (% of people ages 15 and above)	73.7	2009
Mortality rate, infant (per 1,000 live births)	58.1	2010
Mortality rate, under 5 (per 1,000)	92.1	2010
People living with HIV/AIDS, total	920,000	2009
Malnutrition prevalence, weight for age (% under age 5)	15.5	2006
Malnutrition prevalence, height for age (% under age 5)	53.2	2006
Telephone subscribers (%)	16.9	2009/10
Mobile-phone subscribers (%)	15.7	2009/10
Internet users (%)	4.7	2009/10
GEF benefits index for biodiversity (0 = no biodiversity potential to 100 = maximum)	3.5	2008
United Nations Development Programme (UNDP) Environmental Performance Index	51.4	2010

Malawi Qualitative Dimensions

Five recent documents were examined to assess the extent of integration of fisheries and aquaculture into the food security policies and plans of Malawi. These were:

Documents:

1. United Nations Development Assistance Framework (UNDAF), 2012-2016;
2. FAO National Medium Term Priority Framework, 2010-2015;
3. UN Malawi Country Assessment Report (2010);
4. Malawi Food Security Policy (2005);
5. The Importance of Fisheries for Food Security in Malawi, Global Fish Alliance.

The **UN Development Assistance Framework** provides some reference to fisheries and its connection to food security (other references are found when listing the different sectors under agriculture). Under the UNDAF theme 'Sustainable and equitable economic growth and food security,' the UN plans to support the promotion of diversification of food production to improve nutrition, with a focus on crops, livestock and fisheries.

The **FAO National Medium Term Priority Framework** highlights that the fisheries sector has a vast potential that is not yet fulfilled, and special reference is made to the promotion of aquaculture as a way to compensate for the decrease in fish landings. The NMTPF quotes estimates made by the Government of Malawi that fish represents 70 percent of the population's animal protein intake, and that despite nutrition education campaigns and some advances in poverty reduction, animal protein intake remains very limited in Malawi. It also states that despite being the most common and affordable source of animal protein in the country, fish consumption is very low (3-4 kg per capita per year in 2007). Under priority outcome 'Food security and nutrition security,' of the framework, part of the major priority outputs and focused activities are to increase fish productivity with a focus on strengthening the fisheries sector institutional framework and building capacity in aquaculture development. The promotion of a diversified food production and dietary diversification through capacity development and technology transfer is also included. This will help to improve production preservation, processing and utilization of diversified, micronutrient-rich fisheries. Sustainable management and use of fisheries and aquaculture resources is one of the strategic objectives under the food security and nutrition priority outcome. To achieve an increase in fish productivity through aquaculture development under the NMTPF an estimated US $831,000 is required, of which US $31,000 has already been committed.

The **UN Country Assessment** makes reference to child labour in fisheries and mentions the causes and challenges of malnutrition.

Despite the high incidence of fish noted in other documents, there is no mention of fish in the analysis of causes of malnutrition. Some linkages may be found through the inclusion of inadequate food storage, processing and utilization knowledge that results in food wastage. The document also mentions that population growth along with reliance on low productivity agriculture for income generation and unsustainable exploitation of the environment may lead to the degradation and depletion of natural resources like fisheries.

In the chapter on food availability of the **Food Security Policy** document, it states that in order to ensure the availability of food in sufficient quantities, adequate quality and variety to meet demand at all times, one of the outputs foreseen is the promotion of fisheries and aquaculture development. In order to achieve this, the strategies include integrating aquaculture into irrigation development programs; creating a favourable investment environment for fisheries and aquaculture; and empowering local communities to manage fisheries resources.

The Importance of Fisheries for Food Security in Malawi paper collates information from several documents. It states that the fisheries sector in 2003 directly employed 62,000 people and generated an additional 350,000 jobs. The fisheries sector contributed to nearly 4 percent of the GDP in 2002. Fish is estimated to be the single most important source of protein, contributing between 60 and 70 percent of national animal protein. Regarding aquaculture, in 2002 there were about 4,000 farmers that owned and operated around 7,000 fish ponds.

Malawi Quantitative Dimensions

Factors to be considered to assess the role of fish in food and nutritional security	Data & time points	Favorable	Adverse	No data available
Availibility				
Total fish production (marine + inland + aquaculture)	2009-2004	Increasing		
Total physical availability for consumption [total production + imports - exports (in live weight)]	2009-2004	Increasing		
The 'apparent consumption' of fish per capita	2009-2004	Increasing		
Share of small-scale fishers production to the total fish production	2005	High		
Area of land covered by small-scale aquaculture (back yard ponds etc)				
Share of fish imported specifically for local consumption (processed or fresh)	2009	High		
Availability of fish marketing infrastructure in urban and rural areas				
Availability of ice and cold storage facilities				
Accessibility				
Per-capita income (GDP/pop)	2010-2009	Increasing		
General consumer price index	2010-2009		Increasing	
Fish prices compared to other animal protein prices				
Poverty levels and percentage of population below these levels	2004		Low	
Unemployment levels	2004	Low		
Utilisation				
Access to safe water	2008-2000	Increasing		
Infant mortality levels	2009-2000	Decreasing		
Access to sanitation	2010-2000	Increasing		
Stability				
Female literacy	2009-2006	Increasing		
Mention of fish in nutrition education/awareness programs and literature		Present		
Publicity about fish consumption in mass media (newspaper, radio, TV, SMS, etc.)		Present		

MAURITIUS

Mauritius Country Indicators

Indicators	Value	
GDP in real terms (year 2000 USD million)	6,630.5	2010
GDP in nominal terms (USD million)	9,728.7	2010
Land area (km^2)	2,030.0	
Length of coastline (km)	177.0	
Area of territorial waters (km^2)	3,894.0	
Continental shelf area (km^2)	29,061.0	
Area of the exclusive economic zone (EEZ) (km^2)	1,284,997.0	
Total population	1,281,214	2010
Population density (people/km^2)	631.1	2010
Population, female (% of total)	50.6	2010
Rural population (% of total population)	57.4	2010
Population ages 0-14 (% of total)	21.9	2010
Population living below poverty line (%)	8.0	2006
Number of fishers (includes aquaculture)	5,100	2004
People employed in fish processing and marketing	6,800	2004
Total employment in fisheries	11,900	2004
Fish trade/food trade	38.3%	2010
Per capita fish consumption	22.46	2009
Fish imports (tonnes live weight)	147,558.0	2009
Fish exports (tonnes live weight)	132,553.9	2009
Main group of species consumed in the country	Demersal fish	2009
Share of fish in animal protein	18.4	2007
Share of fish in total protein	7.8	2007
Literacy rate, adult female (% of females ages 15 and above)	85.3	2009
Literacy rate, adult male (% of males ages 15 and above)	90.6	2009
Literacy rate, adult total (% of people ages 15 and above)	87.9	2009
Mortality rate, infant (per 1,000 live births)	13.0	2010
Mortality rate, under 5 (per 1,000)	15.1	2010
People living with HIV/AIDS, total	8,800	2009
Malnutrition prevalence, weight for age (% under age 5)	N/A	
Malnutrition prevalence, height for age (% under age 5)	N/A	
Telephone subscribers (%)	114.9	2009/10
Mobile-phone subscribers (%)	85.2	2009/10
Internet users (%)	22.7	2009/10
GEF benefits index for biodiversity (0 = no biodiversity potential to 100 = maximum)	3.3	2008
United Nations Development Programme (UNDP) Environmental Performance Index	80.6	2010

Mauritius Qualitative Dimensions

Two recent documents were examined to assess the extent of fisheries and aquaculture integration into the food security policies and plans for Mauritius. These were:

Documents:

1. Food Security Fund Committee Strategic Plan, 2008-2011;
2. FAO Preparation of a National Medium Term Priority Framework (2007).

The **Food Security Fund Committee Strategic Plan** presents the actions to be implemented in order to increase the country's food self-sufficiency and therefore reduce dependency on food imports and increase resilience against future food crisis. To achieve this, increased fish production in Mauritius and particularly in Rodrigues, as well as aquaculture development promotion are envisaged. The fisheries sector is considered a major contributor to nutrition, food security and revenue generation from foreign trade, while it also contributes to poverty alleviation in the coastal areas of the island. The sector generates about 20,000 direct and indirect jobs; and the tuna processing industry for export is the driving force of imports of raw material. Local fish production has decreased, mainly due to a decrease in artisanal fishery landings and domestic production is estimated to supply 30-40 percent of national consumption. One of the plan's objectives is to ensure a regular supply of fish and fish products for the domestic market, as well as increase the export potential of the sector. Aquaculture (especially prawn farming) is considered to be an opportunity for economic development and a way to contribute to an increase in food sufficiency on the island of Rodrigues. The budget forecast for fisheries and aquaculture activities for the period was MUR 43 million (to invest in four boats, one fish cage culture and the construction of one semi-industrial boat) and MUR 6 million for aquaculture development in Rodrigues (about US $1.4 million and US $190,000 respectively).

The **National Medium Term Priority Framework** refers to the development of fisheries but the main focus is on the development of the sector from a productive and commercial perspective and no reference to the contribution or the impact on food security is made.

Mauritius Quantitative Dimensions

Factors to be considered to assess the role of fish in food and nutritional security	Data & time points	Favorable	Adverse	No data available
Availibility				
Total fish production (marine + inland + aquaculture)	2009-2004		Decreasing	
Total physical availability for consumption [total production + imports - exports (in live weight)]	2009-2004	Increasing		
The 'apparent consumption' of fish per capita	2009-2004	Increasing		
Share of small-scale fishers production to the total fish production	2005		Low	
Area of land covered by small-scale aquaculture (back yard ponds etc)				
Share of industrial fishery catch which is (processed and) sold locally	2005		Low	
Share of fish imported specifically for local consumption (processed or fresh)	2009	High		
Availability of fish marketing infrastructure in urban and rural areas				
Availability of ice and cold storage facilities				
Roads from coast to inland areas	2005	Present		
Accessibility				
Per-capita income (GDP/pop)	2011-2010	Increasing		
General consumer price index	2011-2010		Increasing	
Fish prices compared to other animal protein prices				
Poverty levels and percentage of population below these levels	2006	Low		
Unemployment levels	2010	Low		
Utilisation				
Access to safe water	2008-2000	High		
Infant mortality levels	2009-2000	Decreasing		
Access to sanitation	2010-2000	High		
Stability				
Female literacy	2009-2006	Increasing		
Mention of fish in nutrition education/awareness programs and literature			Absent	
Publicity about fish consumption in mass media (newspaper, radio, TV, SMS, etc.)			Absent	

RWANDA

Rwanda Country Indicators

Indicators	Value	
GDP in real terms (year 2000 USD million)	3,593.7	2010
GDP in nominal terms (USD million)	5,627.7	2010
Land area (km^2)	24,670.0	
Length of coastline (km)	N/A	
Area of territorial waters (km^2)	N/A	
Continental shelf area (km^2)	N/A	
Area of the exclusive economic zone (EEZ) (km^2)	N/A	
Total population	10,624,005	2010
Population density (people/km^2)	430.6	2010
Population, female (% of total)	50.9	2010
Rural population (% of total population)	81.1	2010
Population ages 0-14 (% of total)	42.6	2010
Population living below poverty line (%)	58.5	2006
Number of fishers (includes aquaculture)	32,700	2005
People employed in fish processing and marketing	3,000	2005
Total employment in fisheries	35,700	2005
Fish trade/food trade	2.0%	2010
Per capita fish consumption	1.93	2009
Fish imports (tonnes live weight)	11,786.6	2009
Fish exports (tonnes live weight)	1,387.5	2009
Main group of species consumed in the country	Freshwater and diadromous fish	2009
Share of fish in animal protein	12.8	2007
Share of fish in total protein	1.3	2007
Literacy rate, adult female (% of females ages 15 and above)	66.8	2009
Literacy rate, adult male (% of males ages 15 and above)	75.0	2009
Literacy rate, adult total (% of people ages 15 and above)	70.7	2009
Mortality rate, infant (per 1,000 live births)	59.1	2010
Mortality rate, under 5 (per 1,000)	91.1	2010
People living with HIV/AIDS, total	170,000	2009
Malnutrition prevalence, weight for age (% under age 5)	18.0	2005
Malnutrition prevalence, height for age (% under age 5)	51.7	2005
Telephone subscribers (%)	24.6	2009/10
Mobile-phone subscribers (%)	24.3	2009/10
Internet users (%)	45	2009/10
GEF benefits index for biodiversity (0 = no biodiversity potential to 100 = maximum)	0.9	2008
United Nations Development Programme (UNDP) Environmental Performance Index	44.6	2010

Rwanda Qualitative Dimensions

The extent of fisheries and aquaculture integration into the food security policies and plans of Rwanda were assessed by examining four recent documents. These are:

Documents:

1. United Nations Development Assistance Framework, 2008-2012;
2. FAO NMTPF Rwanda;
3. Strategic Plan for the Transformation of Agriculture in Rwanda – Phase II (Final report – 2009);
4. Agriculture Sector Investment Plan 2009-2012.

In the **UN Development Assistance Framework** there is no reference to fisheries.

In the ***FAO NMTPF Rwanda*** (NMTPF) the reference to fisheries is as one of the productive sectors to be supported by the African Bank of Development, for the development of lake fisheries, and as one of the areas in which FAO is executing projects.

The **Strategic Plan for the Transformation of Agriculture** (SPTA) has, as an overall objective, to increase agricultural output and incomes under sustainable production systems for all groups of farmers, and to ensure food security for the entire population. Under the programme of intensification and development of sustainable production systems and the sub-programme integrated development and intensification of crops and livestock, one of the objectives is to increase the output and value of the fisheries sub-sector. One line of action in this framework is to intensify and extend the programme for management of internal lakes and develop aquaculture with an emphasis on activities like tilapia farming, which can increase food security and nutrition and provide alternative sources of income for rural households. It is also foreseen to promote the development of product chains for domestic and export markets, through the investment in infrastructure and equipment for fishermen in Lake Kivu.

The **Agriculture Sector Investment Plan** takes the SPTA as a basis, and allocates funds for the different programmes, but there is no specific identification of budget for fisheries components.

Rwanda Quantitative Dimensions

Factors to be considered to assess the role of fish in food and nutritional security	Data & time points	Favorable	Adverse	No data available
Availibility				
Total fish production (marine + inland + aquaculture)	2009-2004	Increasing		
Total physical availability for consumption [total production + imports - exports (in live weight)]	2009-2004	Increasing		
The 'apparent consumption' of fish per capita	2009-2004	Increasing		
Share of small-scale fishers production to the total fish production		High		
Area of land covered by small-scale aquaculture (back yard ponds etc)				
Share of fish imported specifically for local consumption (processed or fresh)	2009	High		
Availability of fish marketing infrastructure in urban and rural areas				
Availability of ice and cold storage facilities				
Accessibility				
Per-capita income (GDP/pop)	2011-2010	Increasing		
General consumer price index	2011-2010		Increasing	
Fish prices compared to other animal protein prices				
Poverty levels and percentage of population below these levels	2006		High	
Unemployment levels				
Utilisation				
Access to safe water	2008-2000		Decreasing	
Infant mortality levels	2009-2000	Decreasing		
Access to sanitation	2010-2000	Increasing		
Stability				
Female literacy	2009-2008	Increasing		
Mention of fish in nutrition education/awareness programs and literature		Present		
Publicity about fish consumption in mass media (newspaper, radio, TV, SMS, etc.)		Present		

SEYCHELLES

Seychelles Country Indicators

Indicators	Value	
GDP in real terms (year 2000 USD million)	749.4	2010
GDP in nominal terms (USD million)	936.6	2010
Land area (km^2)	460.0	
Length of coastline (km)	455.0	
Area of territorial waters (km^2)	10,010.0	
Continental shelf area (km^2)	39,063.0	
Area of the exclusive economic zone (EEZ) (km^2)	1,336,559.0	
Total population	86,525	2010
Population density (people/km^2)	188.1	2010
Population, female (% of total)	N/A	
Rural population (% of total population)	44.7	2010
Population ages 0-14 (% of total)	N/A	
Population living below poverty line (%)	N/A	
Number of fishers (includes aquaculture)	2,000	2005
People employed in fish processing and marketing	3,600	2005
Total employment in fisheries	5,600	2005
Fish trade/food trade	81.4%	2010
Per capita fish consumption	58.88	2009
Fish imports (tonnes live weight)	122,198.8	2009
Fish exports (tonnes live weight)	63,470.8	2009
Main group of species consumed in the country	Pelagic fish	2009
Share of fish in animal protein	40.6	2007
Share of fish in total protein	20.2	2007
Literacy rate, adult female (% of females ages 15 and above)	N/A	
Literacy rate, adult male (% of males ages 15 and above)	N/A	
Literacy rate, adult total (% of people ages 15 and above)	N/A	
Mortality rate, infant (per 1,000 live births)	11.7	2010
Mortality rate, under 5 (per 1,000)	13.5	2010
People living with HIV/AIDS, total	N/A	
Malnutrition prevalence, weight for age (% under age 5)	N/A	
Malnutrition prevalence, height for age (% under age 5)	N/A	
Telephone subscribers (%)	130.0	2009/10
Mobile-phone subscribers (%)	104.9	2009/10
Internet users (%)	38.6	2009/10
GEF benefits index for biodiversity (0 = no biodiversity potential to 100 = maximum)	3.5	2008
United Nations Development Programme (UNDP) Environmental Performance Index	N/A	

Seychelles Qualitative Dimensions

Four recent documents were examined to assess the extent of fisheries and aquaculture integration into the food security policies and plans of Seychelles. These were:

Documents:

1. FAO National Medium Term Priority Framework, 2007-2010 (draft);
2. Seychelles CAADP (2011);
3. Seychelles Fisheries Policy, 2005;
4. Seychelles Strategy, 2017.

The **FAO National Medium Term Priority Framework** contains an evaluation of the contribution of the fisheries sector to the national economy, but no estimation of the contribution to food security is given. It estimates that 10 percent of total households, or the equivalent of 8,800 people depend, to some extent, on fisheries related activities; while around 4,500 people are directly or indirectly employed by the fisheries sector. Fisheries are considered the most promising activity in the agricultural sector and have become the second largest employer in the country and the second main source of foreign currency. The government has prepared a National Agricultural and Fisheries Policy 2003-2013 (no copy could be obtained for this analysis), which includes the enhancement of food security as one of the guiding principles.

The **Comprehensive Africa Agriculture Development Programme (CAADP)** document was drawn up to support the implementation of the food security, trade and diversification components of the Seychelles Medium Term National Development Strategy. The development of sustainable fisheries is one of the five focus areas for interventions and investment. The document sets out some production targets for food items that are consumed locally but there is no target for fish production. The contribution of fish to food security is highlighted. Despite the fact that the country relies on imports for a substantial amount of the food consumed, it is acknowledged that fish provides a significant amount of the protein component for the diet and accounts for 35-40 percent of total protein consumed.

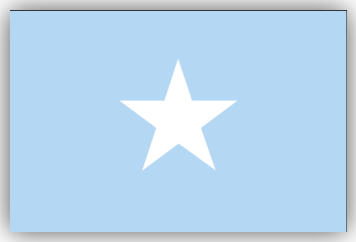
In the **Fisheries Policy** document, the only reference to food security is as one of the overall policy objectives. The policy aims to enhance food supply and food security, with steps to ensure that the country is self-sufficient in terms of fish and that the supply for the domestic market is adequate at all times, with further emphasis on the importance of fish consumption for nutrition.

Strategy 2017 has an overall goal to double the national GDP by 2017, boosting the development of tourism and fisheries, the main economic activities of the country, in order to develop other related activities. Regarding fisheries, the strategic overview is to increase the yield and value, and the financial benefits by maximising domestic production, promoting exports and increasing national stake holding in the industry.

In 2005, the fishing industry accounted for 30 percent of national GDP. In relation to food security and with reference to fisheries the document notes that the country should turn to imported food products when it is more cost effective rather than trying to achieve self-sufficiency. Care should also be taken to ensure that agricultural development policies do not affect the development of key sectors like fisheries.

Seychelles Quantitative Dimensions

Factors to be considered to assess the role of fish in food and nutritional security	Data & time points	Favorable	Adverse	No data available
Availibility				
Total fish production (marine + inland + aquaculture)	2009-2004		Decreasing	
Total physical availability for consumption [total production + imports - exports (in live weight)]	2009-2004		Decreasing	
The 'apparent consumption' of fish per capita	2009-2004		Decreasing	
Share of small-scale fishers production to the total fish production	2005		Low	
Area of land covered by small-scale aquaculture (back yard ponds etc)				
Share of industrial fishery catch which is (processed and) sold locally				
Share of fish imported specifically for local consumption (processed or fresh)		High		
Availability of fish marketing infrastructure in urban and rural areas				
Availability of ice and cold storage facilities				
Roads from coast to inland areas				
Accessibility				
Per-capita income (GDP/pop)	2010-2009	Increasing		
General consumer price index	2010-2009		Increasing	
Fish prices compared to other animal protein prices				
Poverty levels and percentage of population below these levels				
Unemployment levels		Low		
Utilisation				
Access to safe water				
Infant mortality levels	2009-2000	Decreasing		
Access to sanitation	2010-2000	Increasing		
Stability				
Female literacy	2009	Low		
Mention of fish in nutrition education/awareness programs and literature		Present		
Publicity about fish consumption in mass media (newspaper, radio, TV, SMS, etc.)		Present		



SOMALIA

Somalia Country Indicators

Indicators	Value	
GDP in real terms (year 2000 USD million)	1,071.2	2010
GDP in nominal terms (USD million)	1,747.0	2010
Land area (km^2)	627,340.0	
Length of coastline (km)	3,025.0	
Area of territorial waters (km^2)	66,550.0	
Continental shelf area (km^2)	55,895.0	
Area of the exclusive economic zone (EEZ) (km^2)	825,052.0	
Total population	9,330,872	2010
Population density (people/km^2)	14.9	2010
Population, female (% of total)	50.4	2010
Rural population (% of total population)	62.6	2010
Population ages 0-14 (% of total)	44.9	2010
Population living below poverty line (%)	N/A	
Number of fishers (includes aquaculture)	N/A	
People employed in fish processing and marketing	N/A	
Total employment in fisheries	N/A	
Fish trade/food trade	0.9%	2010
Per capita fish consumption	3.02	2009
Fish imports (tonnes live weight)	44.6	2009
Fish exports (tonnes live weight)	2,479.3	2009
Main group of species consumed in the country	Marine fish, other	2009
Share of fish in animal protein	3.0	2007
Share of fish in total protein	1.7	2007
Literacy rate, adult female (% of females ages 15 and above)	N/A	
Literacy rate, adult male (% of males ages 15 and above)	N/A	
Literacy rate, adult total (% of people ages 15 and above)	N/A	
Mortality rate, infant (per 1,000 live births)	108.3	2010
Mortality rate, under 5 (per 1,000)	180.0	2010
People living with HIV/AIDS, total	34,000	2009
Malnutrition prevalence, weight for age (% under age 5)	32.8	2006
Malnutrition prevalence, height for age (% under age 5)	42.1	2006
Telephone subscribers (%)	8.1	2009/10
Mobile-phone subscribers (%)	7.0	2009/10
Internet users (%)	1.2	2009/10
GEF benefits index for biodiversity (0 = no biodiversity potential to 100 = maximum)	6.1	2008
United Nations Development Programme (UNDP) Environmental Performance Index	N/A	

Somalia Qualitative Dimensions

Six recent documents were examined to assess the extent of fisheries and aquaculture integration into the food security policies and plans of Somalia. These were:

Documents:

1. United Nations Somali Assistance Strategy, 2011-2015;
2. FAO 5 Year Strategy and Plan of Action, 2011-2015;
3. FAO/Somalia Plan of Action, 2011-2012;
4. UN-WB Somali Reconstruction and Development Programme – Deepening Peace and Reducing Poverty – Volume I (draft), 2008;
5. Food Security and Nutrition Analysis Unit – Somalia – Food Security and Nutrition Quarterly Brief (June 2012)
6. Food Security and Nutrition Analysis Unit – Somalia – Nutrition Update (May-June, 2012)

The **UN Somali Assistance Strategy** does not make any specific reference to the fisheries or aquaculture sector. However, part of the UN response to reduce poverty and improve livelihoods is to stimulate an increase in production levels for economic sectors through a broad based economic development plan. One of the goals is to successfully expand productive capabilities of the agriculture, livestock and fisheries sector, and this will depend on the empowerment of youth. These sectors rely on the environment and the UN will support the development and utilization of effective and sustainable systems of natural resource management. One of the indicators for the achievement of the outcome 'Key economic sectors increase sustainable production and productivity in partnership with public and private sector' is the level of income from fish sales and consumption of the coastal population, with targets to be set as the percentage increase in income.

The **FAO 5 Year Strategy and Plan of Action's** main goal is to improve livelihoods and food security in the country. The strategy is centred on six strategic components, of which the third is 'sustainable fishing for increased incomes of fishing communities and fishermen' and the following component is 'managing natural resources for recovery and sustainable use'. Under each component, fisheries are also related to the first component of the strategy, 'increasing and stabilizing agricultural production and productivity and rural families' income', since livelihoods and food security depend on production systems based on natural resources: pastoralism, farming and fishing. The 'sustainable fishing for increased incomes of fishing communities and fishermen' component is divided into two outcomes, fishing sustainability, and increased family and community income.

The results under the first outcome are: fisheries sustainably managed and regulated; capacity for surveillance and monitoring fishing activities and to enforce fishing laws and regulations in place; and fishermen awareness, knowledge and adoption of sustainable fishing methods, gear and participatory management increased. The latter outcome falls under one result, to increase in value and quality fish and fish products available for local and export markets. The component 'managing natural resources for recovery and sustainable use', has as one of its results, an improvement in access to natural resource management information, which includes the provision of technical support for land, water, forest and fisheries assessments and management. Although it is not fishery-specific, the first component of the strategy, 'increasing and stabilizing agricultural production and productivity and rural families' incomes, includes as a result the improvement in access to markets and market information, and in terms of activities includes the rehabilitation of infrastructure and local and urban markets, which would also benefit the trade of fishery products.

The document lists marine fisheries as a productive sector. The country does not have information on total annual fish captures, fish stocks or their status. There are no policies, management plans or means to manage marine resources. There is also no infrastructure to support the artisanal fishing industry with equipment, and the marketing chain is rudimentary in most places. Marine resources are mainly exploited by foreign fishing vessels, and therefore, the local economy obtains only a small benefit from this activity. Demand for fishery products is increasing, particularly in urban areas, and there has been a change in the perception of fishing activities, in favour of the development of trade in addition to free and open markets. The sector has received minimal support, and post-harvest losses are thought to be significant. Value addition in the small-scale fisheries sector is virtually inexistent, while the existence of two tuna canning factories indicates that there is room for interventions aimed at developing a processing industry. The development of fisheries is also given as a means to reduce incentives to piracy, through the generation of alternative sources of income. Demand in urban areas exceeds supply, while there is scope for the increase of consumption in inland areas, as long as there is an increase in supply. The document also acknowledges that 'if sustainably is ensured and managed, the Somali fisheries sector has the potential to significantly contribute to the national economy through food security, foreign exchange earnings and the creation of employment opportunities, on the condition that resources are managed in a sustainable manner. Effective and sustainable fisheries resource management will require improved fishing, storage, processing and market access infrastructure as well as adequate research and stock assessments'.

The overall impact of coastal fisheries in the country is small, engaging only 2 percent of the population, but the contribution to household economies is uneven and seasonal. In southern coastal fishing areas, fishing complements livestock income during the dry seasons, while in the north fishing contributes to nearly 90 percent of annual household income.

The lack of regulations implies that both industrial and artisanal fisheries disregard the impact of their activity on marine systems and fish stocks. There are no policy or regulatory frameworks, and there is no institutional strength or resources to implement policy and enforce regulations. Improvement of income for artisanal fishermen is also restrained by the lack of sufficient infrastructure, weak market chains, poor equipment and the absence of quality control and safety certifications. The development of the fisheries sector would bring direct net benefits to people living in coastal areas, through the generation of alternative income options and improved nutrition through the consumption of fish.

The **FAO/Somalia Plan of Action** is derived from the FAO Strategy. It has the same goals and is structured around the same strategic components. The document describes how the strategy will be implemented over the first two years. The Plan of Action aims to reduce poverty, improve food security and gain control of resources in order to assure sustainability. It outlines actions in crucial sectors, among which fisheries and natural resources are included. The areas of action related to fisheries are: to manage and regulate fisheries for sustainability; develop fisheries extension services; build capacity to monitor fishing activities and to enforce fishing laws and regulations; increase awareness and build support among fishermen for sustainable fishing; increase the quality and value of fish products for local and export markets; and development of aquaculture. There is no direct reference to the contribution of fisheries to food security, or the potential of the sector to improve food security in the country. The Plan of Action estimates that nearly 400,000 Somalis obtain their income from fisheries, and it recognizes the potential to generate new employment and foreign currency, while the present situation of the sector limits its contribution to the economy. On the other hand, it states that the potential for aquaculture is not being exploited, and if developed, it could become an important source of employment in rural areas, generate income and improve nutrition. Expected returns of supporting actions in the fisheries sector are the opening of new employment opportunities, increased income and public revenue, but there is no mention of possible enhanced food security, despite the fact that the strategy reports that in the north of the country fisheries account for 90 percent of household's annual income.

The **UN and WB Somali Reconstruction and Development Programme (Volume I)** quotes FAO estimates that fish and crustaceans potential output is up to 1,500 percent higher than current levels.

Throughout the document, references to fisheries focus on three driving concepts: the creation of an environment fit for private investment that allows sector growth, expands employment and reduces poverty; sustainable use of resources, through the establishment of a legal framework and enforcement capabilities; and the reconstruction of infrastructure for business operations and trade. Fisheries are listed as one of the key areas of private sector activity. Among the activities programmed for the Economic Recovery, Institution Building and Resources Mobilization Committee it is the introduction of a sound regulatory framework that improves processing, human resources development, technological and scientific innovation to achieve sustainable and productive fisheries, along with other productive sectors as well as the rehabilitation of the fisheries sector. Support for the private sector is evaluated as key to rapid economic growth and the expansion of productive capacity. One of the short and medium-term priorities listed is the rehabilitation of the ports to ease trade, as well as the extension of a network for secondary ports and jetties to facilitate the development of local fisheries. Fishing is included as one of the key productive sectors to be rebuilt. In order to achieve this, it proposes better regulation of the sector and actions to recover marine resources and to control boats and activities through investment in public infrastructure and equipment to allow enforcement. The document mentions that the search for livelihoods are one of the threats to natural resources, the success to achieve sustainable natural resource management will depend on the generation of alternative livelihoods and employment.

In the section dedicated to 'Improving livelihood and food security', there is a special reference to the impact of illegal fisheries on artisanal fishermen's livelihoods. The priorities to improve and diversify livelihoods and reduce livelihood insecurity, among others are: the rehabilitation of key productive sectors (including fisheries); the expansion of alternative livelihood opportunities through private sector development of other activities; and the rehabilitation of infrastructure to link markets and reduce the cost of doing business. In the results matrix, the monitoring and management of fisheries resources is included as a target outcome as part of the rebuilding of the productive sector and regulations of production falls under the actions and intermediate outcomes to achieve the target of ensuring environmental sustainability. However, there is no reference in the document to the contribution of fisheries to food security, and there is no reference to the development of aquaculture.

The **Food Security and Nutrition Quarterly Brief** refers to the decline in fisheries activities in the northern regions due to the high monsoon period as well as the start-up of trade between Somalia and Yemen. The next seasonal peak for fishing activities is between October 2012 and February 2013. The **Nutrition Update** has only one reference to fisheries, stating that the reduction in fisheries activities due to weather conditions contributed to the poor nutrition situation in the area of Bossasso Town in the north of the country, where the nutrition situation is considered critical.

Somalia Quantitative Dimensions

Factors to be considered to assess the role of fish in food and nutritional security	Data & time points	Favorable	Adverse	No data available
Availibility				
Total fish production (marine + inland + aquaculture)	2009		Low	
Total physical availability for consumption [total production + imports - exports (in live weight)]	2009-2004	Increasing		
The 'apparent consumption' of fish per capita	2009-2004		Decreasing	
Share of small-scale fishers production to the total fish production				
Area of land covered by small-scale aquaculture (back yard ponds etc)				
Share of industrial fishery catch which is (processed and) sold locally				
Share of fish imported specifically for local consumption (processed or fresh)	2009	Increasing		
Availability of fish marketing infrastructure in urban and rural areas				
Availability of ice and cold storage facilities				
Roads from coast to inland areas				
Accessibility				
Per-capita income (GDP/pop)	2009-2010		Decreasing	
General consumer price index				
Fish prices compared to other animal protein prices				
Poverty levels and percentage of population below these levels				
Unemployment levels				
Utilisation				
Access to safe water	2008-2000	Increasing		
Infant mortality levels	2009-2000		High	
Access to sanitation	2010-2000	Increasing		
Stability				
Female literacy				
Mention of fish in nutrition education/awareness programs and literature			Absent	
Publicity about fish consumption in mass media (newspaper, radio, TV, SMS, etc.)		Present		

South Sudan

South Sudan Country Indicators

Indicators	Value	
GDP in real terms (year 2000 USD million)	N/A	
GDP in nominal terms (USD million)	N/A	
Land area (km^2)	644,329.0	
Length of coastline (km)	N/A	
Area of territorial waters (km^2)	N/A	
Continental shelf area (km^2)	N/A	
Area of the exclusive economic zone (EEZ) (km^2)	N/A	
Total population	10,625,176	2010
Population density (people/km^2)	16.5	2010
Population, female (% of total)	N/A	
Rural population (% of total population)	78.0	2010
Population ages 0-14 (% of total)	44.4	2010
Population living below poverty line (%)	N/A	
Number of fishers (includes aquaculture)	N/A	
People employed in fish processing and marketing	N/A	
Total employment in fisheries	N/A	
Fish trade/food trade	N/A	
Per capita fish consumption	N/A	
Fish imports (tonnes live weight)	N/A	
Fish exports (tonnes live weight)	N/A	
Main group of species consumed in the country	*N/A*	
Share of fish in animal protein	N/A	
Share of fish in total protein	N/A	
Literacy rate, adult female (% of females ages 15 and above)	40.0	2009
Literacy rate, adult male (% of males ages 15 and above)	16.0	2009
Literacy rate, adult total (% of people ages 15 and above)	27.0	2009
Mortality rate, infant (per 1,000 live births)	71.8	2010
Mortality rate, under 5 (per 1,000)	N/A	
People living with HIV/AIDS, total	329,380	2009
Malnutrition prevalence, weight for age (% under age 5)	N/A	
Malnutrition prevalence, height for age (% under age 5)	N/A	
Telephone subscribers (%)	N/A	
Mobile-phone subscribers (%)	N/A	
Internet users (%)	N/A	
GEF benefits index for biodiversity (0 = no biodiversity potential to 100 = maximum)	N/A	
United Nations Development Programme (UNDP) Environmental Performance Index	N/A	

South Sudan Qualitative Dimension

Four recent documents were examined to assess the extent of fisheries and aquaculture integration into the food security policies and plans of South Sudan. These were:

Documents:

1. United Nations Development Assistance Framework, 2012-2013;
2. FAO Plan of Action for Southern Sudan, 2010-2012;
3. South Sudan Development Plan, 2011-2013;
4. Government of Southern Sudan Growth Strategy, 2010-2012.

In the **UN Development Assistance Framework** one of the expected outcomes is to reduce chronic food insecurity and increase livelihood opportunities. Under this outcome, it is expected that the UN Country Team will support government efforts to reduce food insecurity and help increase fish production. No other reference to fisheries is included in the document.

In the **FAO Plan of Action for Southern Sudan**, the fisheries sector is mentioned as an important agriculture sub-sector. Fish is an important source of food in South Sudan, as it is a key component of household food baskets. It is also considered to play a central role in the food security of fisher families since fish is also a source of income. The pressure on fish resources is considered limited, and the full potential of the sector has not been reached. The document estimates that South Sudan has the potential to fish 300,000 tonnes from the Nile and other inland water resources. Effective fishing was estimated to be only 10 percent of its potential. Fishing is considered as one of the main livelihoods in two of the five states and has an important role in another. Along the Nile River, fishing communities have problems to access markets to sell their products or to buy equipment. Only a huge investment would significantly contribute to poverty reduction and sustainable growth in the region. Reduced fisheries production and productivity are considered to be factors that undermine food security and livelihoods of the vast majority of rural households. FAO's activities related to fisheries aim to increase the availability and home consumption of fish protein through the provision of essential fishing equipment, and training beneficiaries in improved fish processing techniques, net-making and boat building, in order to develop new techniques and enhance skills in fisheries in target populations.

The **South Sudan Development Plan** aims to increase food security through food production. Although this document does not refer to fisheries directly, the increase in the production of fish commodities is listed as an indicator (goal of increasing production from 40,000 tonnes in 2010 to 100,000 tonnes in 2013). The estimated budget for activities (to enhance marketing and investment capacity and to develop capacity for fisheries and aquaculture) is about US $4 million for the period 2011-2013.

There is no reference to fisheries in the **Government of Southern Sudan Growth Strategy**.

South Sudan Quantitative Dimensions

Factors to be considered to assess the role of fish in food and nutritional security	Data & time points	Favorable	Adverse	No data available
Availibility				
Total fish production (marine + inland + aquaculture)				
Total physical availability for consumption [total production + imports - exports (in live weight)]				
The 'apparent consumption' of fish per capita				
Share of small-scale fishers production to the total fish production				
Area of land covered by small-scale aquaculture (back yard ponds etc)				
Share of industrial fishery catch which is (processed and) sold locally				
Share of fish imported specifically for local consumption (processed or fresh)				
Availability of fish marketing infrastructure in urban and rural areas				
Availability of ice and cold storage facilities				
Roads from coast to inland areas				
Accessibility				
Per-capita income (GDP/pop)				
General consumer price index				
Fish prices compared to other animal protein prices				
Poverty levels and percentage of population below these levels				
Unemployment levels				
Utilisation				
Access to safe water			Low	
Infant mortality levels			High	
Access to sanitation				
Stability				
Female literacy			Low	
Mention of fish in nutrition education/awareness programs and literature				
Publicity about fish consumption in mass media (newspaper, radio, TV, SMS, etc.)				

SUDAN

Sudan Country Indicators

Indicators	Value	
GDP in real terms (year 2000 USD million)	22,819.1	2010
GDP in nominal terms (USD million)	62,045.8	2010
Land area (km^2)	2,376,000.0	
Length of coastline (km)	853.0	
Area of territorial waters (km^2)	18,766.0	
Continental shelf area (km^2)	19,827.0	
Area of the exclusive economic zone (EEZ) (km^2)	68,148.0	
Total population	43,551,941	2010
Population density (people/km^2)	18.3	2010
Population, female (% of total)	49.6	2010
Rural population (% of total population)	54.8	2010
Population ages 0-14 (% of total)	40.1	2010
Population living below poverty line (%)	40.0	2004
Number of fishers (includes aquaculture)	12,900	2006
People employed in fish processing and marketing	51,600	2006
Total employment in fisheries	64,500	2006
Fish trade/food trade	0.5%	2010
Per capita fish consumption	3.02	2009
Fish imports (tonnes live weight)	4,247.1	2009
Fish exports (tonnes live weight)	606.9	2009
Main group of species consumed in the country	Freshwater and diadromous fish	2009
Share of fish in animal protein	1.8	2007
Share of fish in total protein	0.7	2007
Literacy rate, adult female (% of females ages 15 and above)	N/A	
Literacy rate, adult male (% of males ages 15 and above)	N/A	
Literacy rate, adult total (% of people ages 15 and above)	N/A	
Mortality rate, infant (per 1,000 live births)	66.4	2010
Mortality rate, under 5 (per 1,000)	103.3	2010
People living with HIV/AIDS, total	260,000	2009
Malnutrition prevalence, weight for age (% under age 5)	31.7	2006
Malnutrition prevalence, height for age (% under age 5)	37.9	2006
Telephone subscribers (%)	37.2	2009/10
Mobile-phone subscribers (%)	36.3	2009/10
Internet users (%)	9.9	2009/10
GEF benefits index for biodiversity (0 = no biodiversity potential to 100 = maximum)	5.1	2008
United Nations Development Programme (UNDP) Environmental Performance Index	47.1	2010

Sudan Qualitative Dimension

Five recent documents were examined to assess the extent of fisheries and aquaculture integration into the food security policies and plans of Sudan. These were:

Documents:

1. United Nations Development Assistance Framework (UNDAF), 2009-2012;
2. FAO National Medium Term Priority Framework 2008-2012;
3. FAO Plan of Action for North Sudan 2010-2012;
4. FAO Country Programming Framework 2012-2016 (Final draft);
5. National Food Security Action Plan (2008).

One of the outcomes of the **UN Development Assistance Framework** (UNDAF) relates to livelihoods and productive sectors, and under this outcome, the framework mentions that there is a need to increase food security, improve agricultural productivity and strengthen sustainable fisheries practices. There are no further references to fisheries in the UNDAF.

In the **FAO National Medium Term Priority Framework** (NMTPF), all references to fisheries fall under the general context along with the remaining productive sectors, and no reference to the impact on food security is presented.

The **FAO Plan of Action for North Sudan** (PoA) includes limited opportunities and constraints to fisheries production among the factors linked to vulnerability and under-nutrition among food-insecure populations. It estimates that high food prices mean that 76 percent of the resource-limited population are affected by serious food insecurity and this has become a threat for their survival. One of the priorities to cope with the problem of reduced livestock production and productivity is fisheries promotion through training on gear making and fish processing. The goal of FAO's response through the PoA is to improve food security and livelihoods for rural populations and one of the programs to support and improve production is support to fishing households. There is no further relevant reference to fisheries, or any specific fund allocations.

The section dedicated to agriculture, food security and rural development in the **FAO Country Programming Framework**, includes fisheries as part of the agriculture sector. Sudan's potential in terms of fisheries is highlighted given the availability of both freshwater and marine fish resources. It estimates that current captures are no more than 30 percent of potential levels. The availability of these resources is also considered part of the opportunities the country has related to the issue of food security, agriculture and rural development. Under the priority area to enhance production, productivity and competitiveness of the agricultural sector, it is expected that some of the actions to be undertaken by FAO include mobilization of resources and technical assistance for the development of aquaculture and artisanal fisheries.

The **National Food Security Action Plan** (NFSAP), was drawn up prior to the separation of South Sudan but mentions North and South Sudan separately. The document notes that the fisheries sector has significant potential, but gives no reliable quantitative information. One NFSAP's programs is the promotion of smallholder based food production, and part of one of the sub-programs is support for smallholder fisheries production. Fisher folk are considered among the most vulnerable groups in Sudan. Fisheries constitute an important livelihood for displaced populations. The program has a specific component to support small-scale fisher folks. The objective of the first component of the project, related to inland fisheries, is to improve the food security level of fisher folks and other vulnerable groups with livelihoods depending essentially on the traditional fisheries sector. The second component, focused on fresh water rural aquaculture development, aims to improve the health status of vulnerable groups subject to protein deficiency and water borne diseases. This component seeks to address the imbalance in animal protein intake by promoting aquaculture in irrigation channels, in order to control insects and aquatic weeds. The budget allocated for these two components was US $8.25 million and US $2.75 million.

Sudan Quantitative Dimensions

Factors to be considered to assess the role of fish in food and nutritional security	Data & time points	Favorable	Adverse	No data available
Availibility				
Total fish production (marine + inland + aquaculture)	2009-2004	Increasing		
Total physical availability for consumption [total production + imports - exports (in live weight)]	2009-2004	Increasing		
The 'apparent consumption' of fish per capita	2009-2004	Increasing		
Share of small-scale fishers production to the total fish production	2008	High		
Area of land covered by small-scale aquaculture (back yard ponds etc)				
Share of industrial fishery catch which is (processed and) sold locally				
Share of fish imported specifically for local consumption (processed or fresh)	2009	High		
Availability of fish marketing infrastructure in urban and rural areas				
Availability of ice and cold storage facilities				
Roads from coast to inland areas				
Accessibility				
Per-capita income (GDP/pop)	2011-2010	Increasing		
General consumer price index	2011-2010		Increasing	
Fish prices compared to other animal protein prices				
Poverty levels and percentage of population below these levels	2004		High	
Unemployment levels	2002		High	
Utilisation				
Access to safe water	2008-2000		Decreasing	
Infant mortality levels	2009-2000	Decreasing		
Access to sanitation	2010-2000		Decreasing	
Stability				
Female literacy	2009-2008	Increasing		
Mention of fish in nutrition education/awareness programs and literature			Absent	
Publicity about fish consumption in mass media (newspaper, radio, TV, SMS, etc.)		Present		

SWAZILAND

Swaziland Country Indicators

Indicators	Value	
GDP in real terms (year 2000 USD million)	1,845.7	2010
GDP in nominal terms (USD million)	3,645.3	2010
Land area (km^2)	17,200.0	
Length of coastline (km)	N/A	
Area of territorial waters (km^2)	N/A	
Continental shelf area (km^2)	N/A	
Area of the exclusive economic zone (EEZ) (km^2)	N/A	
Total population	1,186,056	2010
Population density (people/km^2)	69.0	2010
Population, female (% of total)	50.8	2010
Rural population (% of total population)	74.5	2010
Population ages 0-14 (% of total)	38.4	2010
Population living below poverty line (%)	69.0	2006
Number of fishers (includes aquaculture)	N/A	
People employed in fish processing and marketing	N/A	
Total employment in fisheries	N/A	
Fish trade/food trade	1.2%	2010
Per capita fish consumption	2.44	2009
Fish imports (tonnes live weight)	2,892.0	2009
Fish exports (tonnes live weight)	107.7	2009
Main group of species consumed in the country	Pelagic fish	2009
Share of fish in animal protein	4.0	2007
Share of fish in total protein	1.3	2007
Literacy rate, adult female (% of females ages 15 and above)	86.2	2009
Literacy rate, adult male (% of males ages 15 and above)	87.8	2009
Literacy rate, adult total (% of people ages 15 and above)	86.9	2009
Mortality rate, infant (per 1,000 live births)	55.1	2010
Mortality rate, under 5 (per 1,000)	77.7	2010
People living with HIV/AIDS, total	180,000	2009
Malnutrition prevalence, weight for age (% under age 5)	6.1	2007
Malnutrition prevalence, height for age (% under age 5)	29.5	2007
Telephone subscribers (%)	59.1	2009/10
Mobile-phone subscribers (%)	55.4	2009/10
Internet users (%)	7.6	2009/10
GEF benefits index for biodiversity (0 = no biodiversity potential to 100 = maximum)	0.1	2008
United Nations Development Programme (UNDP) Environmental Performance Index	54.4	2010

Swaziland Qualitative Dimension

The extent of fisheries and aquaculture integration into the food security policies and plans of Swaziland were assessed by examining six recent documents. These include

Documents:

1. United Nations Development Assistance Framework (UNDAF), 2011-2015;
2. UNDAF 2011-2015 Complementary Country Analysis;
3. Strategy Brief for National Food Security and Agriculture Development, horizon 2015;
4. National Food Security Policy for Swaziland (2005);
5. National Programme for Food Security (draft, 2006);
6. Freshwater Fisheries and Aquaculture Policy in Swaziland (final draft, 2011).

There is no reference to fisheries or aquaculture in the **United Nations Development Assistance Framework** or in the **UNDAF Complementary Country Analysis**.

The **Strategy Brief for National Food Security and Agriculture Development** includes fish as a component of the ideal dietary composition of the Dietary Energy Supply (DES). Fish should, along with other animal products, represent 25 percent of the DES. Animal products represented 14.6 percent of total DES in 2001. The strategy includes, with the objective of improving access to nutritious quality food and its utilization, under the priority area of promotion of alternative non-agriculture rural livelihoods and income earning opportunities, actions aimed at the development and strengthening of sustainable alternative livelihoods and vocational skills in non-agricultural activities, such as aquaculture. With the objective of stimulating marketing of livestock and fisheries products, under the priority area of improvement of fisheries and aquaculture production, actions for the promotion and development of aquaculture to boost income and provide nutritious food are also included.

The **National Food Security Policy** acknowledges that sound policies and strategies on agriculture (including fisheries) are essential to a food security policy. One of the policy principles is to respect and protect the rights of individuals over resources such as fish. Fisheries and aquaculture are included under three of the four pillars of the policy, namely: (i) food availability; (ii) food access, and (iii) food utilisation and nutritional requirements. Under the food availability pillar, in order to improve the impact of gender on food availability through special programmes, the policy aims to gather information and integrate it in programmes aimed at improving food availability, women's traditional knowledge and skills in fisheries. The policy has a specific component for the promotion of fisheries and aquaculture. The potential of fisheries and aquaculture to play an important role in food security by providing food of high nutritional value is also recognised.

The contribution of these sectors to national food security is seen to be minor. The document includes a list of strategies to stimulate the development of fisheries and aquaculture to improve food security, that include the assessment of resources, the integration of projects in national development programmes and the promotion of investment. The promotion of aquaculture as an alternative livelihood to increase income in rural communities is included under the food access pillar of the policy. Finally, under the pillar of food utilization and nutritional requirements, the policy aims to promote food and dietary diversification, as one of the issues is that fish is currently an insignificant component of the national diet.

The **National Programme for Food Security** takes the National Food Security Policy as an input, and proposes interventions. In order to stimulate the development of fisheries and aquaculture to improve food security, the proposed intervention is establishing a fingerling hatchery, with an allocated budget of US $500,000. Among the food security priorities, one of the components is the intensification and diversification of production and one of the subcomponents is aquaculture. This component will focus on the promotion and development of small-scale aquaculture through the establishment of a hatchery and fish farming demonstrations. The outcomes and indicators are the establishment of the hatchery and demonstrations, to identify markets for fish products and to increase fish production and consumption. The budget is US $850,000 (of which US $500,000 is earmarked for the establishment of the hatchery) scaling up to US $1.7 million.

The **Freshwater Fisheries and Aquaculture Policy** also takes the National Food Security Policy as a starting point. As part of its objectives the policy mentions the development of subsistence, small-scale and intensive commercial fish farming; and the integration of fish and agrarian farming into current subsistence and small-scale commercial farming programs. The latter aims, not only to allow farmers to increase their level of food security and income, but also to reduce their dependence on government and donors. Regular access to fish protein is also highlighted as very important for Swaziland, since it represents an important source of nutrition to curb the effects of HIV and AIDS. Subsistence aquaculture (the only type of aquaculture in the country according to the policy document) is not considered to be sustainable in the long term, but its promotion is still seen to be a way to diversify food sources for rural farmers, and therefore, reduce their risk of food insecurity and shortages.

Swaziland Quantitative Dimensions

Factors to be considered to assess the role of fish in food and nutritional security	Data & time points	Favorable	Adverse	No data available
Availibility				
Total fish production (marine + inland + aquaculture)	2009		Low	
Total physical availability for consumption [total production + imports - exports (in live weight)]	2009-2004		Decreasing	
The 'apparent consumption' of fish per capita	2009-2004		Decreasing	
Share of small-scale fishers production to the total fish production	2008	High		
Area of land covered by small-scale aquaculture (back yard ponds etc)				
Share of fish imported specifically for local consumption (processed or fresh)	2009	High		
Availability of fish marketing infrastructure in urban and rural areas				
Availability of ice and cold storage facilities				
Accessibility				
Per-capita income (GDP/pop)	2011-2010	Increasing		
General consumer price index	2011-2010		Increasing	
Fish prices compared to other animal protein prices				
Poverty levels and percentage of population below these levels	2006		High	
Unemployment levels	2006		High	
Utilisation				
Access to safe water	2008-2000	Increasing		
Infant mortality levels	2009-2000	Decreasing		
Access to sanitation	2010-2000	Increasing		
Stability				
Female literacy	2009-2008	Increasing		
Mention of fish in nutrition education/awareness programs and literature				
Publicity about fish consumption in mass media (newspaper, radio, TV, SMS, etc.)				

TANZANIA

Tanzania Country Indicators

Indicators	Value	
GDP in real terms (year 2000 USD million)	19,954.8	2010
GDP in nominal terms (USD million)	23,056.5	2010
Land area (km^2)	885,800.0	
Length of coastline (km)	1,424.0	
Area of territorial waters (km^2)	31,328.0	
Continental shelf area (km^2)	25,611.0	
Area of the exclusive economic zone (EEZ) (km^2)	241,888.0	
Total population	44,841,226	2010
Population density (people/km^2)	50.6	2010
Population, female (% of total)	50.1	2010
Rural population (% of total population)	73.6	2010
Population ages 0-14 (% of total)	44.7	2010
Population living below poverty line (%)	33.4	2007
Number of fishers (includes aquaculture)	171,793	2005
People employed in fish processing and marketing	2,000,000	2005
Total employment in fisheries	2,171,793	2005
Fish trade/food trade	1.2%	2010
Per capita fish consumption	5.69	2009
Fish imports (tonnes live weight)	7,028.9	2009
Fish exports (tonnes live weight)	97,238.5	2009
Main group of species consumed in the country	Freshwater and diadromous fish	2009
Share of fish in animal protein	23.7	2007
Share of fish in total protein	4.0	2007
Literacy rate, adult female (% of females ages 15 and above)	N/A	
Literacy rate, adult male (% of males ages 15 and above)	N/A	
Literacy rate, adult total (% of people ages 15 and above)	N/A	
Mortality rate, infant (per 1,000 live births)	50.0	2010
Mortality rate, under 5 (per 1,000)	75.8	2010
People living with HIV/AIDS, total	1,400,000	2009
Malnutrition prevalence, weight for age (% under age 5)	16.7	2005
Malnutrition prevalence, height for age (% under age 5)	44.4	2005
Telephone subscribers (%)	40.3	2009/10
Mobile-phone subscribers (%)	39.9	2009/10
Internet users (%)	1.5	2009/10
GEF benefits index for biodiversity (0 = no biodiversity potential to 100 = maximum)	14.8	2008
United Nations Development Programme (UNDP) Environmental Performance Index	47.9	2010

Tanzania Qualitative Dimensions

Eight recent documents were examined to assess the extent of fisheries and aquaculture integration into the food security policies and plans of Tanzania. These include:

Documents:

1. National Food Security Policy (NFSP), 2005;
2. Tanzania Agriculture and Food Security Investment Plan (TAFSIP), 2011-12/2020-21;
3. National Nutrition Strategy, July 2009-June 2015;
4. Food Security in Tanzania: Enabling Environment, Opportunities & Constraints;
5. United Nations Development Assistance Plan (UNDAP), 2011-2015;
6. The Zanzibar Food Security And Nutrition Act;
7. Zanzibar Food Security & Nutrition Situational Analysis1, RGoZ, 2006;
8. Zanzibar Food Security and Nutrition Programme, RGoZ April 2008.

The **National Food Security Policy** (NFSP) mentions that about 95 percent of total food requirements in Tanzania are produced domestically. The indicator for food self-sufficiency presented in the document is the self-sufficiency ratio. The document mentions that this ratio may not capture the total extent of food availability, since it does not take into account some food commodities that are produced or obtained at the household level, such as fish and other marine or aquatic products. Fishery products, among other products listed, are important in the Tanzanian food basket and contribute significantly to food availability. It is also worth highlighting that when identifying groups vulnerable to food insecurity, which would require specific interventions, the document does not list fishermen among them. Among other sectorial and sub-sectorial policies with direct impact on food security, reference is made to a National Fisheries Policy (1997), which aims to promote efficient utilization of available fisheries resources in order to contribute to the growth of national and household food supply and dietary diversification. The NFSP has the mission 'to promote sustainable aggregate food production and productivity, trade accessibility and utilisation of safe and nutritionally balanced food'. One of the objectives is to promote sustainable food availability through increased production, productivity and trade. One of the issues related to this objective is the low productivity of labour and other inputs due to inadequate use of inputs or capital that enhance productivity, limited availability of support services and appropriate technologies. In order to cope with this issue, the policy proposes government actions to promote the participation of the private sector in the supply of inputs and activities for the productive sectors, including fishing equipment. To deal with the issue of high post-harvest losses, the government should promote better handling and improved storage of food and food products at all levels, as well as promote value addition to fish.

The **Tanzania Agriculture and Food Security Investment Plan** (TAFSIP) is a ten-year investment plan and not an agricultural development strategy or programme, with a goal of 6 percent annual growth for agricultural GDP. The document uses a broad definition of the agricultural sector, to include all forms of agriculture, livestock, fisheries, forestry, irrigation and natural resource management. The primary beneficiaries will be, among others, smallholder fishing households adopting improved practices that increase food production and cash income generation. The document also acknowledges that smallholders are not a homogeneous group, and include farmers, pastoralists, fishers and combinations of these. According the TAFSIP, Tanzania's production is dominated by small-scale subsistence producers, and this includes fisheries. The fishing sector has been growing at around 5 percent per annum, but is affected by over-exploitation of inshore resources and underutilisation of deep sea resources.

One of the key issues regarding sustainable water resources use and management on mainland Tanzania is the over-exploitation of common property resources, such as fisheries. Key issues regarding productivity on the mainland concern the limited aquaculture practices, while in Zanzibar there is inadequate knowledge of aquaculture and seaweed farming resulting in low exploitation of aquaculture potential. With regard to commercialisation, the key issues that affects growth rates (on the mainland) according to the document are: limited knowledge about value adding opportunities and innovative marketing approaches; poor market linkages forward and backward in the marketing chain; inadequate skills for business; value chain development and value addition etc. In Zanzibar, the main topics related to commercialisation are: the lack of investment in deep sea fisheries development and inshore aquaculture industries (including seaweed production and processing); low fish quality and standards due to poor fishing technology; handling; post-harvest losses and under developed fish value chain; and inadequate quality control infrastructure for fisheries (such as laboratories, fish landing sites, etc.). The overall objective of the investment plan is to transform the agricultural sector in general, from a subsistence to a market-based economy, for which it requires investment in infrastructure, market access and trade for the production of the sectors included in the analysis. Poor infrastructure and inadequate knowledge for producers to identify potential markets (at both the domestic and international level) are seen as constraints for development. The key issues in Zanzibar are: weak management of fish and animal health; poor enforcement of food safety controls in the mainland; low fish quality and standards due to poor fishing technology; handling; post-harvest losses; underdeveloped value chains; and inadequate quality control of infrastructures for fisheries.

With regard to food security, several factors contribute to food and nutrition insecurity. The main factors affecting food security are, among others related to other sectors, low productivity of fisheries, high post-harvest losses depleting food stocks, variable food prices, and inadequate and poor food storage facilities at the household level. Additionally, nutritional security is affected by the low availability of nutritious foods, including fish.

In relation to climate change mitigation and adaptation, in order to broaden the capacity to analyse and predict food security crisis, the plan states the necessity to expand the national cereal balance and include fisheries and other sources of food in the population's diet. Issues of food availability and prices, purchasing power and nutritional needs should also be addressed. One of the relevant issues in Zanzibar is the destruction of coastal and marine eco-systems, as well as the lack of adequate database for fisheries management (the latter point is related to policy reforms and support presented in the plan).

In the chapter dedicated to priority investment areas, the first priority area relates to the use and management of water resources. Improvements in this area are thought to be critical for the sustainability of production and productivity, since the water is used for both irrigation and fisheries. The second main area is productivity and commercialisation. The TAFSIP focuses on increasing the productivity of the main food production sectors as well as fisheries and aquaculture through increased use of improved inputs, extension and research services. Fisheries and aquaculture are considered to play a vital role in the nutritional value of food and are considered to be main income generators in some communities. Specific measures will be taken to improve fisheries and aquaculture production and management, including infrastructure and sanitary measures. Also, in order to increase commercialisation, processing and value addition are considered important, and post-harvest losses are estimated at about 20 percent for the fisheries sector, due to inadequate processing facilities.

The TAFSIP includes a global investment plan, but there is no mention of funds specifically for fisheries and/or aquaculture activities.

In the **National Nutrition Strategy** the only reference to fisheries that can be found is that the Ministry of Fisheries is one of the many agencies that have nutrition concerns.

In the **Food Security in Tanzania: Enabling Environment, Opportunities & Constraints** paper the first reference to the relation between fish and food security is the lack of an analytical framework for the implementation of policies. This refers to a ban on fish exports in order to encourage value addition. This has resulted in lower prices due to reduced demand and threatens food security by reducing the income of fishermen. The paper also states that export taxes and the lack of fish markets have caused an increase in the smuggling fish to Kenya.

The document mentions the impact of rising food prices on food security, allowing for both an increase in income and a hike in the cost of purchasing food. Short term, Tanzania is considered a net food importer and higher food prices deteriorate in terms of trade.

Fishing communities are considered one of the populations' groups that are net food buyers and therefore would be negatively affected by this trend. The impact of fisheries on food security is presented in a specific section. Fisheries contribution to GDP is estimated between 1.6 percent and 3.1 percent. Artisanal fisheries account for 90 percent of the sector's activity, and industrial fisheries account for the remaining 10 percent.

Aquaculture, according to FAO estimates employs 17,000 people (13,000 in fish farming and 4,000 in seaweed farming). Fisheries is considered a fundamental activity for food security, since nearly 30 percent of protein intake by Tanzanians comes from the 10 percent of fish production that it is marketed locally. The development of fisheries faces seven major obstacles: inadequate knowledge of fishery data bases and resources; inadequate quality of fish seeds used in aquaculture; inadequate extension services; lack of funding for research; poor access to capital for fishermen; lack of market information; and poor infrastructure for fish production and processing. The document proposes a series of indicators to assess the signs of food insecurity related to natural resources. The indicators for fisheries are: terms of trade for fish products in local currency (price of exports/price of imports); percentage of fish stocks that are overexploited; and the change in the annual number of fishing vessels committing a severe violation. Finally, in the recommendations section, the paper acknowledges great potential for the development of Tanzania's fisheries, and the fish processing industry in particular, suggesting development of the canning of some species from Lake Tanganyika and Lake Victoria, as well as others from the marine EEZ.

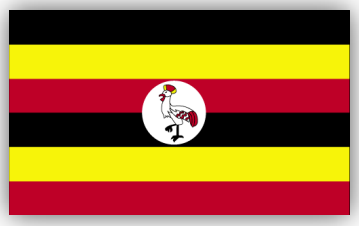
The **UN Development Assistance Plan** makes many references to fisheries. The first one is that fisheries have not benefited from structural changes in the country's economy due to the fact that they are labour intensive. When discussing the environmental and climate change context, the plan mentions that demand for fresh water, natural products and environmental degradation stretch resource utilization and management. There is a special reference to the threat that illegal fishing poses for the sustainability of marine stocks. In the programme of cooperation, no mention is made about fisheries, apart from FAO being listed as the agency responsible for improving fisheries and the Emergency Preparedness and Response (EPR) for fisheries. The document highlights the need for sustainable natural resource management for the country's fresh water and marine areas.

Finally, in the programme results matrix, related to the Millennium Development Goal 'Eradicate extreme poverty and hunger,' and under the national goals of 'Allocating and utilizing national resources equitably and efficiently for growth and poverty reduction' and 'Promoting sustainable and equitable pro-poor and broad based growth,' with the expected outcome of improving enforcement of environmental laws and regulations for the protection of ecosystems, biodiversity and the sustainable management of natural resources, it mentions technical assistance for the implementation of an ecosystem approach to fisheries and a reduction of IUU fishing, in cooperation with FAO. The resources allocated to do this are US $5,750,000.

The three documents on food security in Zanzibar all highlight the importance of fish for food security on the island. They also mention that the fisheries sector is predominantly artisanal, characterized by the use of traditional fishing equipment; fish is the most important source of animal protein and about 99 percent of the average annual fish catch is consumed locally. Artisanal fishermen are identified as those who normally experience food shortages. Fish and legumes are the main source of protein. Fisheries are identified as one of the key areas for interventions, with the promotion of fisheries production and productivity to meet domestic demands and increase the sector's contribution to reducing malnutrition and poverty. The regional policy briefs for Zanzibar are thus very much focused on fisheries, while the national briefs, on the whole, rather neglect fisheries.

Tanzania Quantitative Dimensions

Factors to be considered to assess the role of fish in food and nutritional security	Data & time points	Favorable	Adverse	No data available
Availibility				
Total fish production (marine + inland + aquaculture)	2009-2004		Decreasing	
Total physical availability for consumption [total production + imports - exports (in live weight)]	2009-2004		Decreasing	
The 'apparent consumption' of fish per capita	2009-2004		Decreasing	
Share of small-scale fishers production to the total fish production	2004	High		
Area of land covered by small-scale aquaculture (back yard ponds etc)				
Share of industrial fishery catch which is (processed and) sold locally	2004		Low	
Share of fish imported specifically for local consumption (processed or fresh)	2009	High		
Availability of fish marketing infrastructure in urban and rural areas				
Availability of ice and cold storage facilities				
Roads from coast to inland areas				
Accessibility				
Per-capita income (GDP/pop)	2010-2009	Increasing		
General consumer price index	2010-2009		Increasing	
Fish prices compared to other animal protein prices				
Poverty levels and percentage of population below these levels	2007		High	
Unemployment levels	2006	Low		
Utilisation				
Access to safe water	2008-2000		Low	
Infant mortality levels	2009-2000	Decreasing		
Access to sanitation	2010-2000	Increasing		
Stability				
Female literacy	2009-2006	Increasing		
Mention of fish in nutrition education/awareness programs and literature		Present		
Publicity about fish consumption in mass media (newspaper, radio, TV, SMS, etc.)		Present		



UGANDA

Uganda Country Indicators

Indicators	Value	
GDP in real terms (year 2000 USD million)	12,614.9	2010
GDP in nominal terms (USD million)	17,010.8	2010
Land area (km^2)	197,100.0	
Length of coastline (km)	N/A	
Area of territorial waters (km^2)	N/A	
Continental shelf area (km^2)	N/A	
Area of the exclusive economic zone (EEZ) (km^2)	N/A	
Total population	33,424,683	2010
Population density (people/km^2)	169.6	2010
Population, female (% of total)	50.0	2010
Rural population (% of total population)	86.7	2010
Population ages 0-14 (% of total)	48.4	2010
Population living below poverty line (%)	24.5	2009
Number of fishers (includes aquaculture)	150,000	2002
People employed in fish processing and marketing	550,000	2002
Total employment in fisheries	700,000	2002
Fish trade/food trade	13.0%	2010
Per capita fish consumption	13.47	2009
Fish imports (tonnes live weight)	1,076.9	2009
Fish exports (tonnes live weight)	53,778.4	2009
Main group of species consumed in the country	Freshwater and diadromous fish	2009
Share of fish in animal protein	42.8	2007
Share of fish in total protein	9.5	2007
Literacy rate, adult female (% of females ages 15 and above)	64.6	2009
Literacy rate, adult male (% of males ages 15 and above)	82.6	2009
Literacy rate, adult total (% of people ages 15 and above)	73.2	2009
Mortality rate, infant (per 1,000 live births)	63.0	2010
Mortality rate, under 5 (per 1,000)	98.9	2010
People living with HIV/AIDS, total	1,200,000	2009
Malnutrition prevalence, weight for age (% under age 5)	16.4	2006
Malnutrition prevalence, height for age (% under age 5)	38.7	2006
Telephone subscribers (%)	29.4	2009/10
Mobile-phone subscribers (%)	28.7	2009/10
Internet users (%)	9.8	2009/10
GEF benefits index for biodiversity (0 = no biodiversity potential to 100 = maximum)	2.8	2008
United Nations Development Programme (UNDP) Environmental Performance Index	49.8	2010

Uganda Qualitative Dimensions

Nine recent documents were examined to assess the extent of integration of fisheries and aquaculture into the food security policies and plans of Uganda. These include:

Documents:

1. United Nations Development Assistance Framework (UNDAF) for Uganda, 2010-2014;
2. FAO Country Support Strategic Framework, 2010-2014;
3. Support to capacity building to promote formal marketing and trade of fish and fish products from the Horn of Africa (TCP/RAF/3308) – Country Report Uganda;
4. The Uganda Food and Nutrition Policy (2003);
5. The National Food and Nutrition Strategy (2005);
6. The National Fisheries Policy (2004);
7. Uganda National Aquaculture Development Strategy (2008);
8. Agriculture Sector Development Strategy and Investment Plan, 2010/11-2014/15;
9. Department of Fisheries Resources Annual Report 2010/2011.

The **UN Development Assistance Framework for Uganda** makes very few references to fishery products. References are general to the agricultural sector and mention the impact of increasing production to address high food prices to contribute to food security and nutrition. The document reports that 77 percent of the working population is employed in agriculture and fisheries (it does not differentiate the individual contribution of these sectors). Among the outcomes of the UNDAF are: strengthening capacity building to implement policies and laws for household economies, food and nutrition security; support for research and development; the use of appropriate technologies in fisheries (among other sectors); and protection of the environment and natural resources.

The **FAO Country Support Strategic Framework** (CSSF) is Uganda's National Medium Term Priority Framework for FAO's assistance aimed at supporting achievements of goals set by the national development policy for fisheries and the other productive sectors of the country. The expected outcome of the CSSF is: 'Public institutions, civil society and private sector are providing improved access to socio-economic infrastructure, systems and technologies, for farming communities (especially the vulnerable), for sustainable increase in agricultural production and productivity, household income and food and nutrition security.'

The strategic objectives of the CSSF, which will allow the achievement of this outcome, are: 'to support sustainable increase in household incomes and improved food and nutrition security and reduce vulnerability of the farming communities; to generate and increase access to reliable appropriate information and knowledge on food, crops, livestock, fisheries and forestry and share the good practices and lessons learned within the context of attaining sustainable development; to support enabling policy and regulatory framework development, dissemination and implementation; to support sustainable management utilization of natural resources'.

The document notes the abundance of water and favourable temperatures in Uganda that are suitable for the growth of aquaculture, in addition to the fact that the waters have the potential for this activity and that there is idle capacity for aquaculture. This activity could replace or even surpass the fisheries sector (stated as depleted) if promotion was strong. Uganda is said to be a lead country in this activity in the IGAD region. Overfishing and the use of wrong equipment and methods have resulted in the depletion of stocks in lakes and a decline in the growth of the fisheries sector, while development of aquaculture has been affected by the low capacity to supply the necessary inputs for pond construction, fish fry and feeds. The CSSF also highlights that the fisheries subsector lacks a reference plan, besides the references included in the Agriculture Sector Development Strategy and Investment Plan and the 2009 draft of a fisheries strategy (however, as listed above, some similar documents were found during research for relevant documents). The CSSF also refers to the fact that in the national development frameworks, there is less emphasis on fisheries, although it has high industrial potential, and the fact that fish and fish products are one of the main lead exports. Despite the importance of foreign trade, the document does not mention the contribution of fisheries to food security.

FAO's interventions are structured under five focus areas, and fisheries and aquaculture are mentioned in three of them. Under focus area 1, 'Strategy, Policy and Planning,' and outcome 1.1 "Capacity of national and local government institutions to review, identify policy gaps, develop and harmonise, prioritise, disseminate and implement policies, plans and strategies that increase production, processing, employment, food security and income strengthened,' one intervention is to provide technical assistance in line with policies related to quality assurance and safety for fisheries (and other products), as well as several interventions of a more general profile. Under focus area 2, 'Production and Productivity,' and outcome 2.1 'Capacity of public institutions to deliver increased and sustainable production and productivity strengthened,' related interventions are to provide technical assistance for aquaculture and artisanal fisheries development; and to develop and disseminate tools for surveillance, monitoring, forecasting and control of pests and diseases of fisheries (and other productive sectors).

Under focus area 5, 'Sustainable Natural Resources Management", and outcome 5.2 'Capacity of farming communities to sustainable manage and utilize natural resources to cope with effects of climate change strengthened,' the planned intervention is to promote alternative fish/aquaculture technologies and improve fisheries management. It is worth noting that under the focus area 3, 'Value addition, agro processing and Marketing,' there is no reference to fishery products related to value addition or marketing.

The indicative budget for each focus area are given as follow:

Focus Area	Indicative Budget				
	2010	2011	2012	2013	2014
1. Strategy, Policy and Planning	643,500	1,28,000	1,930,500	2,895,750	4,343,625
2. Production and Productivity	4,664,800	5,529,600	5,044,400	4,816,600	4,474,900
5. Sustainable Natural Resources Management	1,386,100	1,772,200	2,158,300	2,487,450	3,106,175

The **country report for Uganda** from the TCP/RAF/3308 project **Support to capacity building to promote formal marketing and trade of fish and fish products from the Horn of Africa** gives a detailed review of the fisheries sector. Research focused on references to the contribution of fish to food security and poverty alleviation. According to the report, domestic fish consumption is higher than exports and per capita consumption is higher in the IGAD region (10.2 kg). The contribution of the fisheries and aquaculture sectors to food security, livelihoods and revenues from foreign trade is acknowledged as substantial. It is estimated that fisheries contribute 12 percent of agricultural GDP, and 2.5 percent of national GDP. The sector employs about 700,000 people and provides livelihoods to more than 1.2 million people - almost 40 percent of unskilled women are involved in fishing activities - which include fish processing, trading, ownership and trade of equipment, vessels and other services in fish markets and landing sites. According to the report, fish provides up to 50 percent of all animal protein consumption in Uganda.

The **Uganda Food and Nutrition Policy** makes little reference to fish contribution for food security, although many of the goals and strategies have a general approach and could be linked to the fisheries sector. The document mentions that freshwater bodies provide large quantities of fish; while in general, it states that wider use of modern technology could improve production. Under the main topic of 'food supply and accessibility,' - aimed at ensuring an adequate supply and access to good quality food at all times, for human consumption, income generation and domestic and foreign markets - one specific objective is to control fish diseases. Other more general objectives include helping the private sector improve food storage, processing, marketing and distribution systems; and monitoring the trends of food supply and demand in the country.

Increasing the availability of user-friendly micro-financial services for small-scale traders and fisher-folk and developing water systems to promote fish farming are included in the strategies of this focus area. Under the focus area 'food processing and preservation' the policy paper notes that the processing and preservation of animal products is generally underdeveloped. Fish processing has increased significantly, however a large proportion of processed fish is being exported. Related to this latter point, under the topic 'external food trade', the document mentions that fish figure among the processed food products that are being exported. The problem is that food exports are not linked to food production and national requirements and this may give rise to internal food security problems. Therefore, close monitoring of food exports is required to avoid internal shortages.

The **National Food and Nutrition Strategy**, which is related to the policy, makes no reference to fish.

The **National Fisheries Policy** focuses on the fisheries and aquaculture sectors, therefore references relate to the contribution to food security. The policy area dedicated to increasing aquaculture production is explained by the contribution of farming fish and crustaceans to food security, eradicating household poverty and foreign trade. Aquaculture is can be easily integrated into household farming systems, which gives it the potential to have a real impact on the protein intake of the rural poor. The policy area related to fish marketing and trade, to achieve sustainable increases in the value and volume of fish marketed for national consumption and export, is based on the premise that increases in the value and volume of fish traded will generate economic benefits for the fisheries sector. It is thought that these increases will also improve consumer choice and increase the availability of valuable sources of protein. The objectives of this policy are to orient fisheries activities towards commercialization rather than subsistence to increase rural incomes and to increase the market share and value of a variety of fish species destined for foreign markets without compromising domestic food security. The extent of the impact or contribution of fish to national food security, however, is not assessed in the policy paper.

The **Uganda National Aquaculture Development Strategy** document states that it expects to contribute to increased income and food security through aquaculture producers, but no further references regarding the contribution of aquaculture to food security are mentioned. The document presents several components for fisheries development in the framework of the agricultural policy. The diagnosis refers to the contribution of fisheries in terms of employment (as mentioned above), the impact of climate change and other environmental concerns related to fisheries. However, the chapter on food security does not refer to fisheries. The overall objective of the policy is to transform subsistence farming into commercial agriculture, with a vision to achieve a competitive, profitable and sustainable agricultural sector.

The main objectives are to increase rural incomes, livelihoods, improve household food, nutrition and security. In order to achieve this, the immediate objectives are to enhance productivity in fisheries and the remaining sectors, carry out activities related to value addition and markets, protect the environment and strengthen institutions. For each component there are activities related to fisheries, but no impact on food security is mentioned for any of them. For the period between 2010 and 2015, funds were specifically allocated for aquaculture production programs (2010/11: UGX 32,000 million; 2011/12: UGX 41,600 million; 2012/13: UGX 50,210 million; 2013/14: UGX 52,331 million; 2014/2015: UGX 54,464 million).

The **Department of Fisheries Resources Annual Report 2010/ 2011** highlights the importance of fish in diets, and states it is a major source of animal protein for about 34.5 million Ugandans. Some species are considered as the only way to address the prevalent lack of micronutrients (hidden hunger) in the population. The document estimates that between 1 and 1.5 million people are directly or indirectly employed in the fisheries sector and contributing to the livelihoods of nearly 5.3 million people.

Uganda Quantitative Dimensions

Factors to be considered to assess the role of fish in food and nutritional security	Data & time points	Favorable	Adverse	No data available
Availibility				
Total fish production (marine + inland + aquaculture)	2009-2004	Increasing		
Total physical availability for consumption [total production + imports - exports (in live weight)]	2009-2004	Increasing		
The 'apparent consumption' of fish per capita	2009-2004	Increasing		
Share of small-scale fishers production to the total fish production	2004	High		
Area of land covered by small-scale aquaculture (back yard ponds etc)				
Share of fish imported specifically for local consumption (processed or fresh)	2009	High		
Availability of fish marketing infrastructure in urban and rural areas				
Availability of ice and cold storage facilities				
Accessibility				
Per-capita income (GDP/pop)	2010-2009	Increasing		
General consumer price index	2010-2009		Increasing	
Fish prices compared to other animal protein prices				
Poverty levels and percentage of population below these levels	2008		High	
Unemployment levels		Low		
Utilisation				
Access to safe water	2008-2000	Increasing		
Infant mortality levels	2009-2000	Decreasing		
Access to sanitation	2010-2000		Decreasing	
Stability				
Female literacy	2008-2006	Increasing		
Mention of fish in nutrition education/awareness programs and literature		Present		
Publicity about fish consumption in mass media (newspaper, radio, TV, SMS, etc.)		Present		

ZAMBIA

Zambia Country Indicators

Indicators	Value	
GDP in real terms (year 2000 USD million)	5,587.4	2010
GDP in nominal terms (USD million)	16,192.9	2010
Land area (km^2)	743,390.0	
Length of coastline (km)	N/A	
Area of territorial waters (km^2)	N/A	
Continental shelf area (km^2)	N/A	
Area of the exclusive economic zone (EEZ) (km^2)	N/A	
Total population	12,926,409	2010
Population density (people/km^2)	17.4	2010
Population, female (% of total)	49.9	2010
Rural population (% of total population)	64.3	2010
Population ages 0-14 (% of total)	46.4	2010
Population living below poverty line (%)	59.3	2006
Number of fishers (includes aquaculture)	25,000	2004
People employed in fish processing and marketing	30,000	2004
Total employment in fisheries	55,000	2004
Fish trade/food trade	2.0%	2010
Per capita fish consumption	7.55	2009
Fish imports (tonnes live weight)	4,872.6	2009
Fish exports (tonnes live weight)	1,972.0	2009
Main group of species consumed in the country	Freshwater and diadromous fish	
Share of fish in animal protein	20.3	2007
Share of fish in total protein	4.9	2007
Literacy rate, adult female (% of females ages 15 and above)	61.3	2009
Literacy rate, adult male (% of males ages 15 and above)	80.6	2009
Literacy rate, adult total (% of people ages 15 and above)	70.9	2009
Mortality rate, infant (per 1,000 live births)	68.9	2010
Mortality rate, under 5 (per 1,000)	111.0	2010
People living with HIV/AIDS, total	980,000	2009
Malnutrition prevalence, weight for age (% under age 5)	14.9	2007
Malnutrition prevalence, height for age (% under age 5)	45.8	2007
Telephone subscribers (%)	34.8	2009/2010
Mobile-phone subscribers (%)	34.1	2009/2010
Internet users (%)	6.3	2009/2010
GEF benefits index for biodiversity (0 = no biodiversity potential to 100 = maximum)	3.8	2008
United Nations Development Programme (UNDP) Environmental Performance Index	47.0	2010

Zambia Qualitative Dimensions

Five recent documents were examined to assess the extent of fisheries and aquaculture integration into the food security policies and plans of Zambia. These include:

Documents:

1. United Nations Development Assistance Framework (UNDAF), 2011-2015;
2. FAO National Medium Term Priority Framework, 2013;
3. Sixth National Development Plan, 2011-2015;
4. Fisheries in Zambia: An undervalued contributor to poverty reduction (2009);
5. The Governance of Small-Scale Fisheries in Zambia (2007).

There is no reference to the fisheries sector in the **UN Development Assistance Framework**.

The **FAO National Medium Term Priority Framework** (NMTPF) mentions that the fisheries sector showed a negative growth rate between 2000 and 2005 and its potential to contribute to food security and employment was affected due to under-capitalization, lack of environmental awareness among fisher folk, weak extension services and lack of private investment. The document estimates that over 300,000 people are involved in activities related to fisheries. The average per capita consumption is estimated at 7 kg and this accounts for more than 40 percent of animal protein intake in the average diet. Fish is therefore considered an important source of high quality animal protein. Demand surpasses supply but the sector is constrained by poor infrastructure. One of the challenges in the fisheries sector is the declining yield due to population growth in fishing areas and unsustainable fishing practices. The promotion of aquaculture development is seen as an opportunity to increase fish yields and contribute to food security and GDP. Under the Fifth National Development Plan 2008-2010, there were ZMK 195,000 million (about US $40 million) allocated for fisheries development. Under the national priority 'Improved food availability,' and output 'Improved national capacity to analyse and manage disaster, climate change adaptation and risk, including environmental risks,' fisheries is included as a specific priority sector to carry out activities, such as support for the preparation of an aquaculture programme at the national level and the design and implementation of programmes for the improvement of artisanal fisheries.

In the **Sixth National Development Plan** (SNDP) fisheries is one of the key sectors of interest for nutrition. In this section, there is no further analysis of the contribution of the different sectors to nutritional security in the country. The SNDP is focused on enhancing the investment of sustainable production and higher productivity of fisheries, in line with the Fifth National Development Plan (FNDP). An increase in fisheries and aquaculture production will be considered as a result of the FNDP. The contribution of the fisheries sector to the 2009 GDP is estimated at about 3.2 percent.

The strategic focus for the fisheries sector is on aquaculture development and infrastructure for fisheries research and marketing, as well as investment promotion. The SNDP presents a list of strategies focused on the promotion of trade, management and information towards achieving sustainable exploitation of resources. The budget allocated for the Fisheries Development for the 2011-2015 period is ZMK 171,000 million (about US $35 million), with an incremental yearly distribution.

The **Fisheries in Zambia: An undervalued contributor to poverty reduction** paper prepared by the WorldFish Center, collates information from several reports and documents. The contribution of fisheries to the GDP in 2007 was estimated at around 1.2 percent, but despite this low contribution at the aggregated level, the contribution of fish production is important to the rural economy through employment, income generation and food supply. The estimate for fish with regard to total animal protein intake is low at around 20 percent. Nevertheless, it highlights the important role of fish and fish products for food and nutrition security, especially for the urban poor and people living with HIV/AIDS (fisher folk and female fish traders are considered to be a population group with at risk of HIV). Demand for fish is growing in the country due to population growth and increasing urbanization. According to consumer surveys in 2008, the most common fish species were among the leading items driving the inflation of food prices. Fish processing and marketing is dominated by artisanal operations and in order to safeguard and increase the economic and food security value of the sector, the major constraints are post-harvest losses (estimated at nearly 30 percent), low access to improved technologies, services and financing. The recommendations are: to implement a strategic approach to secure the needs for the sector's human resources; support the integration of aquaculture in the context of small-scale water resources development at the community and household level; with a focus on multi-purpose use in order to increase food security and reduce livelihood vulnerability.

The Governance of Small-Scale Fisheries in Zambia document focuses on the management of the fisheries sector. It quotes similar estimations for the contribution of fisheries to GDP, total animal protein intake and the level of annual per capita consumption as mentioned above. The document mentions that fish is one of the cheapest animal proteins in the country and is therefore a key product in securing household food security.

Zambia Quantitative Dimensions

Factors to be considered to assess the role of fish in food and nutritional security	Data & time points	Favorable	Adverse	No data available
Availibility				
Total fish production (marine + inland + aquaculture)	2009-2004	Increasing		
Total physical availability for consumption [total production + imports - exports (in live weight)]	2009-2004	Increasing		
The 'apparent consumption' of fish per capita	2009-2004	Increasing		
Share of small-scale fishers production to the total fish production	2008	High		
Area of land covered by small-scale aquaculture (back yard ponds etc)				
Share of fish imported specifically for local consumption (processed or fresh)	2009	High		
Availability of fish marketing infrastructure in urban and rural areas				
Availability of ice and cold storage facilities				
Accessibility				
Per-capita income (GDP/pop)	2011-2010	Increasing		
General consumer price index	2011-2010		Increasing	
Fish prices compared to other animal protein prices				
Poverty levels and percentage of population below these levels	2006		High	
Unemployment levels	2006		High	
Utilisation				
Access to safe water	2008-2000	Increasing		
Infant mortality levels	2009-2000	Decreasing		
Access to sanitation	2010-2000	Increasing		
Stability				
Female literacy	2009-2008	Increasing		
Mention of fish in nutrition education/awareness programs and literature		Present		
Publicity about fish consumption in mass media (newspaper, radio, TV, SMS, etc.)		Present		

ZIMBABWE

Zimbabwe Country Indicators

Indicators	Value	
GDP in real terms (year 2000 USD million)	4,081.7	2010
GDP in nominal terms (USD million)	7,474.0	2010
Land area (km^2)	386,850.0	
Length of coastline (km)	N/A	
Area of territorial waters (km^2)	N/A	
Continental shelf area (km^2)	N/A	
Area of the exclusive economic zone (EEZ) (km^2)	N/A	
Total population	12,571,454	2010
Population density (people/km^2)	32.5	2010
Population, female (% of total)	50.7	2010
Rural population (% of total population)	61.7	2010
Population ages 0-14 (% of total)	38.9	2010
Population living below poverty line (%)	68.0	2004
Number of fishers (includes aquaculture)	4,700	2004
People employed in fish processing and marketing	N/A	
Total employment in fisheries	4,700	2004
Fish trade/food trade	3.0%	2010
Per capita fish consumption	1.40	2009
Fish imports (tonnes live weight)	5,375.3	2009
Fish exports (tonnes live weight)	1,093.2	2009
Main group of species consumed in the country	Freshwater and diadromous fish	2009
Share of fish in animal protein	3.0	2007
Share of fish in total protein	0.6	2007
Literacy rate, adult female (% of females ages 15 and above)	89.4	2009
Literacy rate, adult male (% of males ages 15 and above)	94.7	2009
Literacy rate, adult total (% of people ages 15 and above)	91.9	2009
Mortality rate, infant (per 1,000 live births)	50.9	2010
Mortality rate, under 5 (per 1,000)	79.8	2010
People living with HIV/AIDS, total	1,200,000	2009
Malnutrition prevalence, weight for age (% under age 5)	14.0	2006
Malnutrition prevalence, height for age (% under age 5)	35.8	2006
Telephone subscribers (%)	27.0	2009/10
Mobile-phone subscribers (%)	23.9	2009/10
Internet users (%)	11.4	2009/10
GEF benefits index for biodiversity (0 = no biodiversity potential to 100 = maximum)	1.9	2008
United Nations Development Programme (UNDP) Environmental Performance Index	47.8	2010

Zimbabwe Qualitative Dimensions

Four recent documents were examined to assess the extent of fisheries and aquaculture integration into the food security policies and plans of Zimbabwe:

Documents:

1. United Nations Development Assistance Framework (UNDAF), 2012-2015;
2. FAO Country Programme Framework, 2012-2015;
3. FAO Country Analysis Report (2010);
4. Zimbabwe Food Security Issues Paper.

The **UN Development Assistance Framework** does not include any reference to fisheries. Under the national development priority 'Food security at household and national levels,' the focus is on agriculture or the sustainable use of natural resources, under the framework of assistance for agriculture development. Under the national development priority 'Sound management and use of the environment, natural resources and land to promote sustainable development,' references are for water as a resource or biodiversity as a whole with no focus on fisheries.

The **FAO Country Programme Framework** makes general references to fisheries along with agriculture and forestry. Whilst there is no mention of the contribution of fisheries to food security in the section dedicated to food security, agriculture or resource management, it estimates that livestock and fisheries account for about 40 percent of the agricultural GDP. It also states that this contribution remains underestimated in comparison with the crop sector. The CPF also mentions that the fisheries sector has remained marginalized despite available water resources in dams. The fragmentation of functions among many agencies is a challenge for the implementation of development plans in fisheries and remaining productive sectors. Fisheries are included with the remaining sectors under priority areas in terms of strengthening competent institutions and increasing productivity, diversification and competitiveness in the smallholder sector, with a special focus on the implementation of gender-sensitive models. Although it is not specifically mentioned in the document, the priority matrix included in the annex mentions the sustainable management of fisheries and aquaculture resources under the CPF priority of disaster risk reduction and management as an FAO priority.

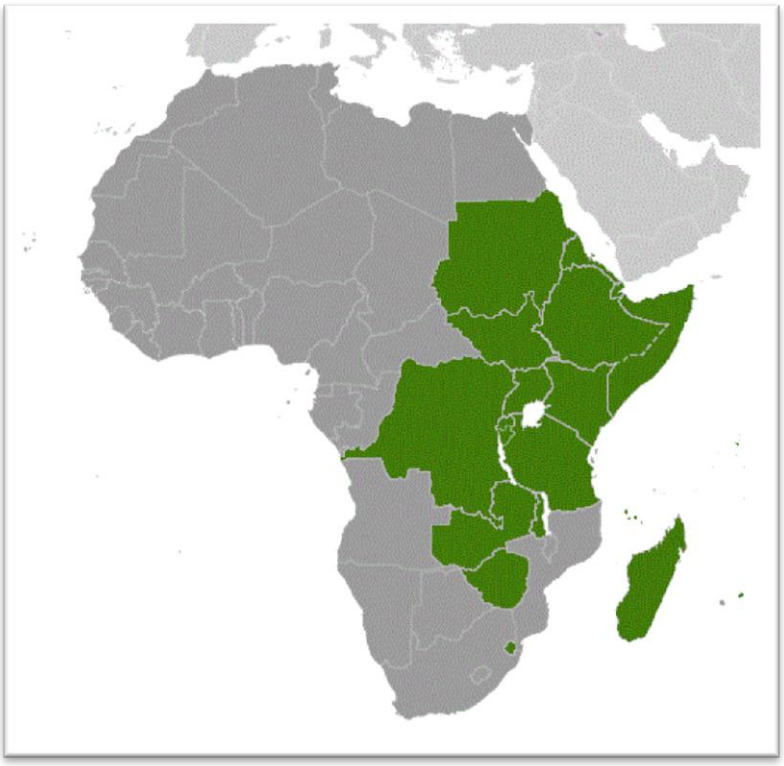
In the **FAO Country Analysis Report** there is no reference to fisheries (except for the negative impact of water weed species on fish stocks). The main section focuses on land priorities for agriculture and environment refers to water and natural resources. When the report mentions agriculture more specifically for identifying priority development areas for improved food security, no mention is made of fisheries or aquaculture.

In the **Zimbabwe Food Security Issues Paper** there is no reference to fisheries or aquaculture.

Zimbabwe Quantitative Dimensions

Factors to be considered to assess the role of fish in food and nutritional security	Data & time points	Favorable	Adverse	No data available
Availibility				
Total fish production (marine + inland + aquaculture)	2009-2004	Increasing		
Total physical availability for consumption [total production + imports - exports (in live weight)]	2009-2004	Increasing		
The 'apparent consumption' of fish per capita	2009-2004	Increasing		
Share of small-scale fishers production to the total fish production	2008	High		
Area of land covered by small-scale aquaculture (back yard ponds etc)				
Share of fish imported specifically for local consumption (processed or fresh)	2009	High		
Availability of fish marketing infrastructure in urban and rural areas				
Availability of ice and cold storage facilities				
Accessibility				
Per-capita income (GDP/pop)	2011-2010	Increasing		
General consumer price index	2011-2010		Increasing	
Fish prices compared to other animal protein prices				
Poverty levels and percentage of population below these levels	2008		High	
Unemployment levels	2009		High	
Utilisation				
Access to safe water	2008-2000	Increasing		
Infant mortality levels	2009-2000	Decreasing		
Access to sanitation	2010-2000		Decreasing	
Stability				
Female literacy		Increasing		
Mention of fish in nutrition education/awareness programs and literature		Present		
Publicity about fish consumption in mass media (newspaper, radio, TV, SMS, etc.)		Present		

Regional Documents



Qualitative Dimensions

Ten recent documents were examined to assess the extent of fisheries and aquaculture integration into the food security policies and plans in the region. These include:

Documents:

1. FAO's Renewed Commitment to a Hunger Free Horn of Africa – Programme of Work and Results Framework;
2. FAO Horn of Africa Response – Medium and Long Term Agriculture and Food Security Investments;
3. FAO Regional Strategic Framework for Africa;
4. IOC Food Security Strategy;
5. Economic Commission for Africa, Sub-regional Office for Eastern Africa – An Overview of the Food Security Situation in Eastern Africa;
6. East African Community Food Security Action Plan 2011-2015;
7. Regional Food Security and Risk Management Programme – Inventory on Policy Measures for Food Security and Prioritisation in the IGAD Region, IGAD;
8. Comprehensive Africa Agriculture Development Programme (CAADP) – Framework for African Food Security;
9. Measures to Address Food Security in the SADC Region;
10. INFOSA: Fisheries in the SADC Region, Selected Country Profiles (2007).

The **FAO Renewed Commitment to a Hunger Free Horn of Africa** presents a brief description of the activities and projects to be carried out by FAO in countries of the region. It does not include any specific reference to the effect of contribution from fisheries sector activities to national or regional food security.

In the **FAO Horn of Africa Response – Medium and Long Term Agriculture and Food Security Investments**, references are made to fisheries relationships to food security under the presentation of the strategy for Somalia, which mentions sustainable fishing for increased incomes of fishing communities as one of six strategic areas for action.

The **FAO Regional Strategic Framework for Africa** considers that sustainable management of fisheries (and other natural resources) is key to attaining food security and environmental stability in Africa. The document also includes an estimate that fish provides 19 percent of total animal protein intake in Africa, although fish per capita consumption has stagnated and is showing a decreasing trend. The main agreements related to food security are given and investment in fisheries and aquaculture is one of the NEPAD/CAADP priorities.

One of the four priorities of the Regional Office for Africa is: to promote sustainable natural resource management (support for fisheries policies and institutionalization of framework development falls under this agenda); to encourage fisheries equipment and infrastructure improvement; and to promote commercial aquaculture.

In the **IOC Food Security Strategy** there is no reference to fish.

The **Overview of the Food Security Situation in Eastern Africa** provides a brief overview on the food security situation in the different countries and fish is mentioned under the Democratic Republic of Congo and points to a declining trend of landing sites and the use of imports to supply demand in the larger cities. Further on in the document, the food security programmes undertaken in the RECs are listed. Under the agreement of the International Conference on the Great Lakes Region, food security is part of the economic development and regional integration programme, which focuses on agriculture, livestock and fisheries development.

The **EAC Food Security Action Plan** mentions that inadequate institutional support for the fishing industry (both capture and aquaculture fisheries) as one of the constraints in achieving food security in the EAC. It estimates that between 24 and 48 percent of the GDP accounted for by the agriculture sector might be under-estimated because fisheries, livestock and other food supply systems are not always taken into account. One of the priority areas for the plan is to increase quality food availability. Subcomponents of this area are to increase agricultural (which includes fisheries) productivity and make the region a net food exporter, as well as to improve the exploitation of alternative food sources, such as fisheries. The expected output of the latter would be to diversify food products. More specific actions are required in order to promote fish farming and sustainable exploitation of marine resources. The estimated cost of this output (which includes other activities also) is US $101 million.

The **Inventory on Policy Measures for Food Security and Prioritisation in the IGAD Region** does not make any reference to measures that involve the fisheries sector or that include fish consumption as a component of the policy.

One of the strategic responses to food insecurity mentioned in the **Framework for African Food Security** is to increase the supply of affordable commodities through increased production and improved market linkages. Under this strategy there is a plan to facilitate the attainment of continental self-reliance for aquaculture by 2015. No further references to fisheries or aquaculture are given in the document.

One of the objectives of the **Measures to Address Food Security in the SADC Region** document is to enhance and stabilize fishery production. It is suggested that diversification towards fisheries activities in rural communities in riverine areas would offer increased livelihood opportunities for these communities. Small-scale fisheries are mentioned as being able to generate significant profits, improve resilience to shocks, and make meaningful contributions to poverty alleviation and food security.

In order to stabilize production, it is recommended that member states improve fish stock management and fish product quality. The improvement of policies for the sustainable management of marine resources and inland fisheries, up scaling of aquaculture and quality improvements in fish handling, processing and distribution are considered the key challenges for the fishery industry.

In the **Fisheries in the SADC Region** document there is no mention of the contribution of fisheries to food security in the region or countries analysed.

Final Comments

The approach of the fisheries sector and its contribution to national food security in the region is very uneven. Some countries give fisheries a key role in food security and strongly emphasize the importance of the fisheries sector for diversified livelihoods and food security, fish being one of the main sources of animal protein. In other countries the role of fisheries is marginal. In many cases, fisheries are included along with livestock, forestry and agriculture under a general definition of the agricultural sector. However, planning and actions programmed for the agricultural sector, in many cases, do not have any direct relation to the fisheries sector when analysed further.

In the majority of countries, the marine fisheries sector is still considered to be under-exploited. However, fisheries management is a key issue that is addressed in all documents that refer to fisheries. Inland fisheries are more affected by unsustainable exploitation of the resources. This is because they are more accessible to rural households and communities and become an alternative source for food and livelihood. In many cases, fishing is a secondary activity that households undertake in order to complement their diet or as an alternative source of food in times of scarcity. The development of aquaculture is given as a goal in some of the food security, poverty alleviation and/or development plans, but in many cases, emphasis is put on improved performance of the inland and marine capture sector.

It is worth noting that the focus of some reports is on fisheries as an export sector, as a way to generate revenue and foreign exchange to finance food purchases required to alleviate food insecurity. This approach to fisheries is based on the availability of high valued species, with good acceptance in high-end markets.

Another issue that appears throughout the documents reviewed is the lack of storage capacity and market infrastructure. This results in high post-harvest losses and reduced production prices, which also restricts the contribution of fisheries to poverty alleviation and increases food security, by reducing the income of fishing households.

The fishing sector in the countries reviewed is mainly small-scale and artisanal. The processing industry is more focused on export markets. Seychelles, for example, operates as a major hub for tuna. The predominance of small-scale fisher folks and subsistence fisheries, along with the poor institutional capacity to follow-up on the performance of the sector implies that, in many cases, the relevance of the fisheries sector might be under-estimated.

Annex 4. Questionnaire to be filled by policy makers and fishery managers

Thank you for agreeing to participate in this short survey, which is being conducted in all the 20 countries participating in the ESA-IO SmartFish program.

Please indicate your name and official designation. Please be assured that your identity will not be revealed. The information gathered will be disseminated in a consolidated form.

Full Name: _____
Official Designation: _____
Country: _____
Place and Date: _____

Signature: _____

1. Are fisheries (marine and/or inland) an important economic activity in your country?

   YES / / NO/ /

2. Is fish processing for export an important activity in your country?

   YES / / NO / /

3. Do you have fishing agreements with other countries for undertaking fishing in your country's EEZ?

   YES / / NO / /

4. Which animal protein is most preferred by the consumers in your country? Kindly rank in order of preference (1, 2, 3, etc.).

   Chicken ☐ Beef ☐ Fish ☐

   Mutton ☐ Pork ☐ Other ☐ (specify) _____

5. Does fish play an important role in the food and nutritional security of your country today?

   YES / / NO / /

6. In your opinion then, what are the <u>three most important factors</u> that will help to **increase** the role of fish in the food and nutritional security of your country?

   1. _____
   2. _____
   3. _____

7. The table below lists some of the factors that have a bearing on the role of fish in food and nutritional security.

Kindly indicate if they have a favorable impact, an adverse impact or no impact on the role of fish in food and nutritional security in your country.

(Put a tick (√) in the appropriate column)

No.	Some of the factors which have a bearing on the role of fish in food and nutritional security	Favorable impact	Adverse impact	No impact
1	Increase in total fish production of the country from all water sources			
2	Overall increase in fish imports			
3	Increase in fish exports			
4	Decrease in the share of fish harvested by small-scale fishers in the country			
5	Increase in small-scale aquaculture in the country			
6	Increase in fish harvested by industrial fishing vessels in the EEZ			
7	Increase in fish imports meant exclusively for domestic consumption			
8	Good market facilities for retail sales of fish			
9	Availability of ice and cold storage facilities			
10	Improvement in roads from coast to inland areas			
11	Decrease in per-capita income			
12	Rise in the general consumer price index			
13	Increase in fish prices			
14	Decrease in the number of persons living below the poverty line			
15	Increase in the employment levels			
16	Improvement in the access to clean water			
17	Increase in the infant mortality levels			
18	Improvement in the access to sanitation			
19	High Vitamin A deficiency			
20	High level of female literacy			
21	Increase of information and education in the country about role of fish in nutrition			
22	Media publicity campaigns undertaken on the benefits of fish consumption			

1. Do you have any nutrition education or awareness programs in your country that specifically mention the benefits of fish consumption for human health and nutrition?

   No / /
   Yes / /

   Please provide details:

   _____
   _____
   _____

2. Can you provide examples of any publicity campaigns – in the newspapers, TV, Radio, SMS alerts – which encourage people to consume more fish?

   We have no such campaigns / /
   Yes, we do have examples / /

   Please provide details of the most important one:

   _____
   _____
   _____

3. Are there any specific legislations, regulations, policies or development plans in your country, that **directly** contribute to enhancing the role of fish in food and nutritional security in your country?

   YES / / (Please provide specific references below)
   NO / / (Please provide information on what you think needs to be done to make this happen)

   _____
   _____
   _____

Thank you for your cooperation

SmartFish is a regional fisheries programme managed by the Indian Ocean Commission, funded by the European Union and co-implemented by the Food and Agriculture Organization of the United Nations. SmartFish, which operates in 20 countries throughout the East and Southern Africa - Indian Ocean region, focuses on fisheries governance, management, monitoring, control and surveillance, trade, and food security.

Incorporating and integrating food security into country plans and policies and turning them into a reality on the ground is of great importance. The role of fish as a wholesome and inexpensive food source for achieving food security merits serious consideration. This report presents the results of a preliminary assessment of the integration of fisheries and aquaculture into food and nutrition policy frameworks of 20 countries in the East and Southern Africa and Indian Ocean region.

Following an initial assessment examining the awareness levels of national fishery officers, quantitative country data was used to determine needs and scope for raising awareness with respect to factoring fish into food and nutritional security scenarios. Finally, a desk review looked at country policies and plans to identify those countries where fisheries play an important role in the national and regional economy, but are neglected in policy discussions, especially when dealing with food security issues.

"*[…] fish should be regarded as one of the most important sources of food in any program for raising the nutritional levels of peoples throughout the world."*

Funded by

European Union