



Food and Agriculture Organization
of the United Nations



Livelihoods of small-scale fishers along the Nile River in Sudan



Livelihoods of small-scale fishers along the Nile River in Sudan

Paula Anton and Lori Curtis

Food and Agriculture Organization of the United Nations
Regional Office for Near East and North Africa

Cairo, 2017

The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations (FAO) concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by FAO in preference to others of a similar nature that are not mentioned.

The views expressed in this information product are those of the author(s) and do not necessarily reflect the views or policies of FAO.

ISBN 978-92-5-109794-6

© FAO, 2017

FAO encourages the use, reproduction and dissemination of material in this information product. Except where otherwise indicated, material may be copied, downloaded and printed for private study, research and teaching purposes, or for use in non-commercial products or services, provided that appropriate acknowledgement of FAO as the source and copyright holder is given and that FAO's endorsement of users' views, products or services is not implied in any way.

All requests for translation and adaptation rights, and for resale and other commercial use rights should be made via www.fao.org/contact-us/licence-request or addressed to copyright@fao.org.

FAO information products are available on the FAO website (www.fao.org/publications) and can be purchased through publications-sales@fao.org.



Preparation of this document

The study “Livelihoods of small-scale fishers along the Nile River in Sudan” was executed collaboratively by the Food and Agriculture Organization of the United Nations (FAO)¹ and the Sudanese Ministry of Animal Resources, Fisheries and Rangelands, and was supported by the Small Scale Family Farming Regional Initiative of the FAO Regional Office for Near East and North Africa (RNE).

¹ FAO support was provided through the Fisheries and Aquaculture Department, the Regional Office for Near East and North Africa and the FAO Representation in Sudan.

Recommended citation

Anton, P & Curtis, L. 2017. Livelihoods of small-scale fishers along the Nile River in Sudan. Food and Agriculture Organization of the United Nations. FAO Regional Office for Near East and North Africa. Cairo.

Contents

Preparation of this document	iii
Figures.....	vi
Tables.....	vii
Acknowledgements	viii
Acronyms and abbreviations	ix
Executive summary	x
1. Introduction	1
1.1 Background and study rationale.....	1
1.2 Objectives of the study.....	3
1.3 Methodology	3
2. Fisheries situation in Sudan.....	8
3. Results of the assessment.....	10
3.1 Description of households.....	10
3.1.1 Household Expenditures.....	11
3.1.2 Household assets	15
3.1.3 Household livelihoods	15
3.2 Fishing activity	17
3.2.1 Fishing seasons	17
3.2.2 Fishing vessels and gear	18
3.2.3 Fish catch	21
3.2.4 Catch composition.....	24
3.2.5 Sales of catch.....	27
3.2.6 Household consumption.....	29
3.3 Involvement of women in the inland fisheries sector.....	31
3.4 Post-harvest sector.....	34
3.4.1 Landing sites	34
3.4.2 Fish processing.....	34
3.4.3 Fish trade within the country	37
3.4.4 Marketing	38
4. Preliminary analysis	39
5. Stakeholders' workshop outcomes.....	41
6. Recommendations.....	43
References.....	47
Appendices.....	49
Appendix 1. Fishers questionnaire	49
Appendix 2. Women questionnaire	55
Appendix 3. Market questionnaire	57
Appendix 4. Stakeholder's workshop agenda	58

Figures

Figure 1. Map of Sudan, assessment area	4
Figure 2. Fishers’ focus group in Souqi, Sennar State.....	6
Figure 3. Women’s focus group in Al-Hogna, River Nile State	6
Figure 4. Reported fish production in Sudan in 2014 (tonnes, percent)	8
Figure 5. Number of fishers per household in Blue Nile, Sennar, White Nile, River Nile and Northern states.....	11
Figure 6. Household access to electricity.....	11
Figure 7. Household access to running water	11
Figure 8. Household expenditures	12
Figure 9. Household expenditures by state.....	12
Figure 10. Household expenditures by village	13
Figure 11. Fuel and electricity costs against type of electricity	14
Figure 12. Water costs against access to running water	15
Figure 13. Livelihood sources of fishers interviewed.....	16
Figure 14. Income contribution of livelihood source	16
Figure 15. Household livelihood sources by state	17
Figure 16. Household income contribution of livelihood source by state.....	17
Figure 17. Sharoaq vessel, Sennar state	19
Figure 18. Feluka vessel, Sudan.....	19
Figure 19. Murkab Al-Hadeed vessel, Northern State	19
Figure 20. Fishing gear used by fishers.....	20
Figure 21. Number of fishers per boat.....	21
Figure 22. Number of fishing days per week.....	22
Figure 23. Average daily fish catch per boat by fishing season and state	23
Figure 24. Range of daily fish catch by state during the main fishing season	23
Figure 25. Range of daily fish catch by state during poor fishing season	23
Figure 26. Range of daily fish catch by state during average fishing season	23
Figure 27. Composition of catch during main fishing season.....	25
Figure 28. Composition of catch in poor fishing season.....	26
Figure 29. Composition of catch in average fishing season	26

Figure 30. Catch consumption vs sales	27
Figure 31. Demand for fish catch.....	27
Figure 32. Sales location of catch.....	28
Figure 33. Frequency and method of fish preservation	28
Figure 34. Average number of times that meals are cooked and eaten per day in the household, by state.....	30
Figure 35. Average number of days per week fish is cooked in the different states during high season.....	30
Figure 36. Composition of fish consumed per state	31
Figure 37. Woman making nets in Koika, Northern State	32
Figure 38. Local <i>feseekh</i> producer in Wadi Halfa, Northern State	35
Figure 39. Local seller of dried fish in Sennar market, Sennar State	35
Figure 40. Individual processor cleaning and scaling fish at a landing site in Kosti, White Nile State	36
Figure 41. Market processors cleaning, scaling and gutting fish for a restaurant in Khartoum, Khartoum State	36
Figure 42. Insulated truck receiving the catches at the landing site in Wadi Halfa, Northern State for export to Khartoum	37
Figure 43. Participants of the stakeholders' workshop in Khartoum	41

Tables

Table 1. Focus group villages and composition	5
Table 2. Fish production by location, 2008	9
Table 3. Household composition and human assets.....	10
Table 4. Summary of fishing seasons.....	18
Table 5. Vessel type	19
Table 6. Brief description of fishing gear used	20
Table 7. Main fish species identified as fish catch.....	24
Table 8. Women's involvement in fishery activities in the different villages	33

Acknowledgements

The authors would like to express their gratitude, for all the support provided, to the Ministry of Animal Resources, Fisheries and Rangelands in Khartoum, and in particular to the extension offices of Damazin, Sennar, Kosti, Damar and Wadi Halfa.

We would also like to thank the FAO Sudan representation, Abdi Jama, FAO Sudan Representative; El Mardi Ibrahim, Livestock Technical Officer; and the rest of the team, and especially Veronica Quattrola, Deputy FAO Representative, for her indefatigable and precious support, which was essential for the organization of our mission all along the Nile.

Special thanks to El Nouman Babikir Mohammed Ahmed, Professor of El-Neelain University, for his unlimited energy, infinite patience and rich knowledge, indispensable during the eternal hours of field work, and for his endless reviews of the draft report. Thanks to Nadia Karoum, Director General of Fisheries and Aquatics of the Ministry of Livestock, Fisheries and Rangelands, for her great humour and permanent positivity even in the worst situations. Many thanks, of course, to the great drivers of the mission, Emad Eldin Zahran and Shieb Hassan, for their round-the-clock tolerance and strength along the 4 000 km mission.

Additionally, we are grateful to Piero Mannini, FAO headquarters Senior Liaison Officer, for his technical support before and during the mission; to Haydar Fersoy, FAO RNE Senior Fishery and Aquaculture Officer, for his inputs for the draft report; to Dianne Berest for editing and proofreading the final document; to Phoebe Lewis, Junior Professional Officer (Agronomist), for her support editing the final draft; and to studio Bartoleschi for the layout.

Finally, and importantly, we wish to convey our most profound gratitude to the fishers, the women and all the members of the fishing communities visited during the mission, for their patience, energy and support, for leaving aside their daily tasks to sit during hours with us to provide all the information we required.



Acronyms and abbreviations

CCRF	Code of Conduct of Responsible Fisheries
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross domestic product
IUU	Illegal, unreported and unregulated fisheries
MLFR	Ministry of Livestock, Fisheries and Rangelands
MCS	Monitoring, control and surveillance
NGO	Non-governmental organization
RNE	Regional Office for Near East and North Africa
UN	United Nations
UNDP	United Nations Development Program

Executive summary

The inland fisheries sector in Sudan represents an important source of livelihoods and well-being for individuals and communities, as well as a potential means to enhance food security in the country. Despite this, the populations that depend on the sector presently suffer from poverty, lack of employment, food insecurity, illiteracy, health constraints, gender inequality and poor policy protection, all resulting in living conditions that do not reach acceptable levels of human dignity. Inland fishing communities are often located in isolated and marginalized locations. Consequently, their potential is hidden and often forgotten. The immense aquatic resources provided by the Nile River could be sustainably exploited by improving the policy framework, promoting stakeholders' participation in decision-making processes, developing appropriate infrastructure, promoting cooperation among the different actors in the value chain, implementing a fisheries management framework, strengthening local technical capacity, setting up social security systems and empowering the most marginalized groups (women, youth, the disabled, etc.). Through such actions, the resources of the Nile River could become an indispensable source of livelihoods and food security for these populations.

This study is the result of a socio-economic livelihoods and food security assessment of fisher households along the Nile River in Sudan, conducted in October 2015, the analysis of the data collected, and a National Stakeholders' Workshop held in December 2015. The main goal of the socio-economic assessment was to better understand the dynamics of the fisheries and aquaculture sector and the livelihood situation, challenges and constraints of the small-scale fishers of the Nile, the White Nile and the Blue Nile. The assessment covered the technical, social and economic aspects of the small-scale fisheries, including: household information, technical capacity, employment, social security and gender schemes as well as post-harvest activities; the aim being to assemble data and information in order to promote the sustainable development of the sector.

The assessment showed that the inland fisheries sector is facing important challenges, such as weak value chains, lack of resource management, lack of social security systems, little diversity in income generating activities, and lack of participation of important stakeholder groups, such as women and, in some cases, the small-scale fishers themselves.



A national stakeholders' workshop was organized with the participation of representatives from the different stages of the value chain of the Sudanese fisheries sector (fishers, women from fishing communities, national and local authorities, market representatives and traders), from the six states included in the assessment (Blue Nile, Sennar, White Nile, Khartoum, Nile and Northern). Workshop participants discussed the results of the field assessment, examined the main socio-economic challenges facing the inland fisheries and developed recommendations for the sustainable improvement of the sector nationwide.

The overall objective of the study was to generate strong, practical recommendations based on the real challenges and context of the inland fishing communities in order to better design, plan, implement, monitor and evaluate future projects in Sudan. The recommendations that were developed include the following:

- » implement a national fisheries management program;
- » strengthen fishing cooperatives/associations;
- » enhance and grow the aquaculture sector;
- » enhance the role of women in the sector;
- » optimize the value chain;
- » capitalise on the opportunity offered by the production of *feseekh* (a traditional salted fish).





1. Introduction

1.1 Background and study rationale

The Republic of the Sudan (Sudan), the third largest country in Africa, sits at the crossroads of sub-Saharan Africa and the Middle East, bordered to the north by Egypt, to the east by the Red Sea, Eritrea and Ethiopia, to the south by South Sudan, and to the west by the Central African Republic, Chad and Libya. Khartoum is the capital and the most populous city of Sudan.

Freshwater resources are concentrated in the Nile River system and cover over two million hectares, with the total length of rivers, lakes and reservoirs estimated at 6 400 km. The Blue Nile and White Nile rivers meet in Khartoum to form the Nile River, which flows northwards through Egypt to the Mediterranean Sea. The Blue Nile's course through Sudan is nearly 800 km long and the Dinder and Rahad rivers join it between Sennar and Khartoum. The White Nile is nearly 500 km long within Sudan and has no significant tributaries. There are several reservoirs created by dams on the Nile rivers. Relevant for the study are the Sennar and Damazin dams on the Blue Nile, the Jebel Aulia Dam on the White Nile, the Merowe Dam on the Nile, and Lake Nubia on the Sudanese-Egyptian border. The Nile River system is home to a wealth of aquatic resources within the country, which offer strong potential for the growth of fisheries and aquaculture. Capture fisheries activities are centred on the Nile rivers, their tributaries, seasonal flood plains and the major reservoirs.

<< Fisherman selling his daily catch in Mayernu, Sennar state

Sudan, with an estimated population of 41 million in 2016 (UN, 2016), presents substantial disparities between urban and rural areas, encouraging rural-urban migration that weakens agricultural productivity and extends poverty in both urban and rural areas (UNDP, 2010).

Presently, the contribution of fisheries to the gross domestic product (GDP) is marginal. However, their contribution to national food security is increasing day by day. Sudan's inland capture fisheries produced approximately 29 000 tonnes in 2014 (FAO, 2016), 85 percent of the country's total production of fish.

Annual per capita fish consumption in Sudan is exceedingly low, at approximately 0.95 kg per year compared with the African average of about 10.7 kg per year and the Near East and North Africa average of 12 kg per year (FAO, 2013). However, the importance of fish in the Sudanese diet is rapidly increasing and the country is dependent on imports of fish and fishery products to satisfy domestic consumption. The government is making an effort to increase domestic production and consumption of fish. According to the last FAO yearbook (FAO, 2016), protein derived from fish comprises only 1.1 percent of total animal protein consumed and 0.3 percent of total protein consumed in Sudan. This may not be surprising considering the important role of livestock in Sudan; however, it seems particularly low when considering the country's wealth of freshwater resources. Additionally, the cost of red meat is beyond the reach of many households and there is an urgent need to secure more affordable sources of protein, such as fish, for the entire population.

Although there is potential to increase inland fish production by enhancing the value chain, inland fisheries have remained at a subsistence level. They are small-scale and entirely artisanal, operated by both regular and seasonal fishers using inherited gear and traditional techniques for capture, handling and preservation. Fishing communities are some of the poorest and most neglected communities in Sudan. In addition to traditional inland fisheries, a new generation of opportunistic fishing communities has risen up around dams built throughout the country that withdrew the communities' productive lands. These communities learn and adopt traditional fishing practices from the old fishing communities, operate at subsistence level and suffer from the same levels of poverty and neglect.

An important number of small-scale fisher populations along the Nile in Sudan continue to experience food and livelihood insecurity. This is due to a combination of factors including 21 years of conflict resulting in the prolonged isolation of the communities, poor resource management, inefficient value chains (in terms of handling and hygiene, processing and marketing, disrupted trade and supply channels, etc.), poor infrastructure and institutions, lack of investment and financing, insufficient capacity and training, and lack of adequate income sources and employment opportunities.

Women can play a critical role in every step of the small-scale fisheries value chain and can make significant contributions at the community and household levels. At present, women make up 50 percent of the global workforce of small-scale fisheries, mostly engaged in processing, marketing and trade, as stated in the last FAO yearbook (FAO, 2016). In Sudan, women in inland fishing communities are involved in the fisheries work in many

different ways, although their contribution is generally invisible, informal and rarely remunerated. Women face particular challenges in participating fisheries activities due to constraints such as lack of education and leadership, the time they must dedicate to domestic tasks and family care, limitations of movement outside the household, community rules and values regarding women's roles and position in society and limited access to natural and economic resources and social services, as indicated in the FAO report *Mainstreaming gender in fisheries and aquaculture* (2013).

An understanding of fishers' livelihood strategies is important to determine appropriate fisheries management measures to ensure sustainable production, efficient development of the value chain, capacity development and decent employment opportunities and to secure sustainable livelihoods and household food security.

This study provides a non-statistically significant snapshot of fishers' livelihoods and households in specific communities along the Nile in Sudan. The purpose of the study is to provide an initial assessment and overview of the main challenges faced by these households and, through a stakeholder's workshop, to collect strong, practical recommendations based on the real challenges and context of the fishing communities.

1.2 Objectives of the study

The objective of the study was to better understand the dynamics of the fisheries sector and the livelihood situation of the small-scale fishers of the Nile, the White Nile and the Blue Nile and to identify the challenges and constraints they face, taking into account environmental, socio-economic and institutional aspects, in order to determine appropriate fisheries management measures to ensure:

- » sustainable fisheries production;
- » efficient development of the value chain, capacity development and decent employment opportunities;
- » sustainable livelihoods and household food security.

1.3 Methodology

The study consisted of four phases:

- » literature review of the existing context of inland fisheries in Sudan;
- » field assessment of the livelihoods of small-scale fishers along the Nile River;
- » analysis of field data;
- » stakeholders' consultation workshop.

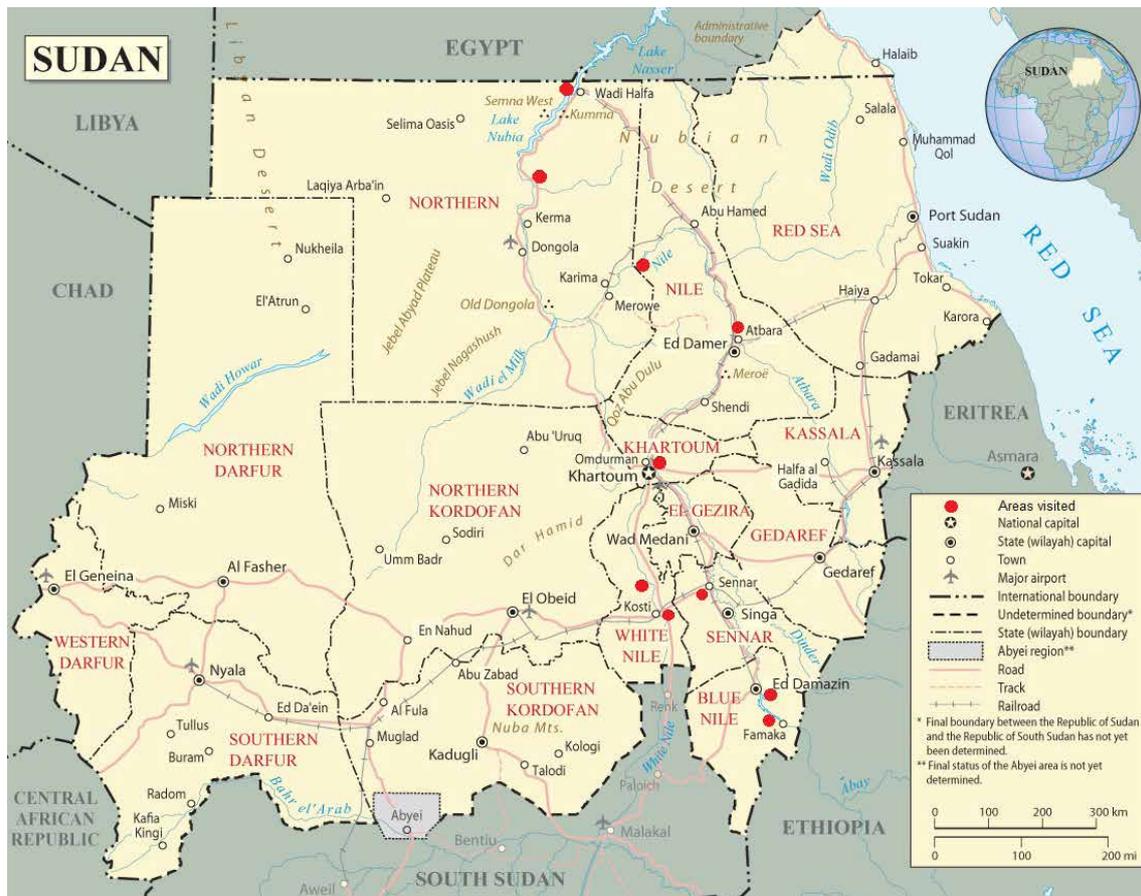
These phases comprise the body of this report, beginning with a brief description of the existing conditions of inland fisheries, based on the literature available; continuing with the presentation of the results of the field assessment, a preliminary analysis of those results, a description of the outcomes of the stakeholders' consultation workshop; and concluding with clear recommendations to better manage inland fisheries in Sudan.

The field assessment was undertaken by a team composed of four technical experts, two nationals: El Nouman Babikir Mohammed Ahmed, El-Neelain University Professor, and Nadia Karoum, Director General of Fisheries and Aquatics of the Ministry of Livestock, Fisheries and Rangelands; and two from FAO: Paula Anton, FAO RNE Fisheries and Aquaculture Officer; and Lori Curtis, FAO Fisheries Economist.

The assessment was carried out over the course of 17 days in October 2015, in 19 villages in six of the seven states through which the Nile passes in Sudan: Blue Nile, Sennar, White Nile, Khartoum, River Nile and Northern (Figure 1). The composition of the fishers and women’s focus groups are shown below in Table 1. The field team requested that each focus group be made up of 12 to 15 fishers; however, in many cases the group size exceeded this number. Information from 17 focus groups was utilized, as noted in Table 1.

The villages where the study was conducted are located along the Blue Nile, the White Nile and the Nile in both riverine environments and beside the reservoirs of the Roseires, Sennar, Merowe and Aswan dams. Officers from the local fisheries authority and leaders of fishing cooperatives assembled the focus groups in each village.

Figure 1. Map of Sudan, assessment area



Source: United Nations, 2012 (edited)

Table 1. Focus group villages and composition²

STATE	VILLAGE	NUMBER OF PARTICIPANTS, FISHERS' FOCUS GROUP	NUMBER OF PARTICIPANTS, WOMEN'S FOCUS GROUP
Blue Nile	Village 4	20	14
	Village 1	20	10*
	Village 8	17	7
	Village 9	18	6
Sennar	مايرنو / Mayernu	9	3
	أم شوكة / Oum Shawka	20	8
	السوكي / Souqi	10	14
White Nile	كوستي / Kosti	25	9
	زنوبة / Zai Nuba	22	9
	أم ضحيفة / Oum Deheka	15	8
River Nile	عطبرة / Atbara	12	7
	الحقنة / Al-Hogna	15	9
	شيري / Shiri	10	5
Northern State	Lake Nubia Fishing Camp	10	-
	دغيم جنوب / Degaim South	9	14*
	ملك الناصر / Malek El Naser	14	18
	عكاشة / Akasha	23*	5*
	كويكا / Koika	-	4

* The information from this focus group was not used to inform the assessment as it was not representative or the participants did not cooperate.

The following interviews and focus groups were conducted:

- » Local authorities of the Ministry of fisheries and leaders of fishing cooperatives: Informal interviews were held in each governorate and background information on the fisheries sector in the area was collected.
- » Fishers' focus groups: Focus groups were conducted, using a questionnaire, with a total of 360 fishers in 18 villages in five states (Blue Nile, Sennar, White Nile, Nile and Northern states). In each village, approximately 20 fishers participated in each focus group (Figure 2). Additionally, an informal focus group discussion was organized in Khartoum with fishers and members of four fishing associations from four different villages. Information was collected on the current situation of small-scale fisheries, fishing activities, households, livelihoods, technical capacity and employment.
- » Women's focus groups: Also using a questionnaire, focus groups were conducted with a total of 150 women from 17 fishing communities in five states (Blue Nile, Sennar, White Nile, Nile and Northern states) (Figure 3). Information was collected on the household situation, livelihoods, fish consumption, social security, gender schemes and post-harvest activities.

² For the sake of consistency and to avoid possible confusion, when transliterating names of villages, fish species, gear and boats from Arabic, the Arabic script is provided the first time the name is used.

- » Fish market stakeholders: Market managers, market association members, retailers and traders were organized into focus groups in three states (Khartoum, Sennar and Northern). Additionally, interviews, using questionnaires, were conducted with key informants at landing sites, fish markets and restaurants/fish shops in five states (Khartoum, Blue Nile, Sennar, White Nile and Northern). Information on the overall situation of the post-harvest sector was collected.

Figure 2. Fishers' focus group in Souqi, Sennar State



©FAO/Paula Anton

Figure 3. Women's focus group in Al-Hogna, River Nile State



©FAO/Lori Curtis

The questionnaires were designed to collect as much information as possible on fishing activities and socio-economic and livelihoods conditions and are presented in Appendices 1, 2 and 3. In order to gain an understanding of the most common situation in the community, focus group participants were advised to consider their own personal situation as well as the common situation in their community when contributing to the discussions. Additionally, it was explained that the purpose of the focus group setting was to hear from a wide range of voices, that there were no right or wrong answers, and that all should feel free to answer the questions. The main interviewers, speaking in Arabic, did their best to elicit responses from all focus group participants, to encourage discussion on each question, and to ensure that no one participant dominated the focus groups.

The focus groups with both fishers and women were intended to be as informal as possible and were conducted in the villages of the participants in order to ensure their comfort.

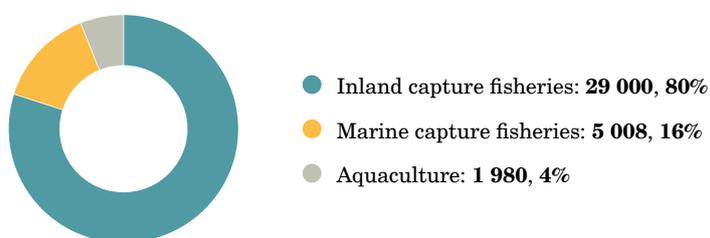
The information from the focus groups is subject to some degree of inaccuracy for the following reasons: The focus groups were organized and the attendees chosen by the local authorities, who were sometimes present during the focus groups; travel time and distance were taken into account when considering which villages to visit; and, as the translation provided during focus groups and interviews was not official, the translation of the participants' comments could have been affected by the subjectivity of the translator.

2. Fisheries situation in Sudan

Sudan has a population of 40 234 882 (World Bank, 2015) and extends over an area of 1 861 million km². Statistics on fish production are difficult to calculate for Sudan. The last submission of official fisheries production information to FAO took place in 2009. Since then statistics have been estimated. Adding to this, since the separation of South Sudan, much of the information available on freshwater statistics and fisheries has not been updated and it is difficult to understand the context of the inland fisheries for the Republic of Sudan alone. However, some basic information is available from sources such as FAO and the web page of the Ministry of Animal Resources, Fisheries and Rangelands.³

According to information provided to FAO, fish production in 2014 totalled 35 988 tonnes, and was comprised of inland capture fisheries (81 percent), marine capture fisheries (14 percent) and aquaculture (5 percent) (Figure 4).

Figure 4. Reported fish production in Sudan in 2014 (tonnes, percent)



³ www.marf.gov.sd



©FAO/Paula Anton

Fisherman cleaning his net in Mayernu, Sennar state

Some statistics available from the Ministry of Livestock, Fisheries and Rangelands provide a disaggregation of fish production data which permits a more complete understanding of fish production in each state (Table 2).

Table 2. Fish production by location, 2008.

ZONE	STATE	PRODUCTION (TONNES)
Jebel Aulia Dam / خزان جبل أولياء	Khartoum	7 000
Lake Nubia / بحيرة النوبة	Northern	3 000
White Nile / النيل الأبيض	White Nile	8 000
Sennar Reservoir / بحيرة خزان سنار	Sennar	1 000
Roseires Reservoir / خزان الروصيرص	Blue Nile	1 500
Khashm el-Girba Reservoir / خزان خشم القرية	Kassala	800
River Nile / نهر النيل	River Nile	3 000
El Gezira / الجزيرة	El Gezira	700
Northern Sudan* / شمال السودان	Northern	4 000
TOTAL		29 000

Source: Ministry of Livestock, Fisheries and Rangelands [webpage accessed Dec 2016]

*Excluding Lake Nubia (which is already mentioned in the table as 3 000 tonnes)

3. Results of the assessment

3.1 Description of households

Information on the number of people in households, number of livelihood sources and number and type of household assets was requested to determine how dependent the households were on fishing, their livelihoods diversity and other factors that could be useful when considering interventions to impact households. Table 3 shows the general composition of households. The average household size is 10.5 people, with a range of 6 to 16 people, and the average number of livelihood sources contributing to household income is 1.9, ranging from 1 to 3. The average number of people contributing to the household income is 2.4, with a range of 1.5⁴ to 4.

The number of fishers per household varies among fishing communities along the Nile (Figure 5). A clear correlation exists between the number of fishers per household and the sources of income and/or dependency on fishing in each household. When fishing

Table 3. Household composition and human assets

	AVERAGE	MINIMUM	MAXIMUM
Average number of persons in household	10.6	6.0	16.0
Number of livelihood sources	1.9	1.0	3.0
Number of people contributing income	2.4	1.5	4.0

⁴ Answer provided was 1 to 2 people for this community.

provides the entire income of the household, the number of fishers in the household increases. In the Northern, River Nile and White Nile states, household income comes mainly from fishing activities and, thus, the percentage of fishers per household is higher (27 percent, 30 percent and 26 percent, respectively). Blue Nile and Sennar states have lower percentages of fishers per household, at 16 percent and 13 percent, respectively.

Households generally have some form of electricity (Figure 6), either through access to the grid (59 percent) or through their own generator (23 percent). However, 18 percent of focus group communities have no access to electricity. Access to running water is evenly split at 50 percent of the communities having access and 50 percent not having access (Figure 7).

3.1.1 Household Expenditures

Household expenditures were discussed in percentage values rather than absolute costs, due mainly to time constraints and to the focus group format. Understanding the composition of each item in terms of annual household expenditure provides insight into the importance of cash income for households and into the general food security and social well-being context of the households. Overall, food is the largest expenditure item, comprising 36 percent of total household expenditure. This is followed by health/medical expenses and education, at 13 and 11 percent, respectively. Clothes, transportation, water, electricity and social obligations comprise the next largest items, ranging between 5 and 9 percent (Figure 8). Rent was only cited as an expenditure item by two village focus groups and as such is not considered a common expense.

Figure 5. Number of fishers per household in Blue Nile, Sennar, White Nile, River Nile and Northern states

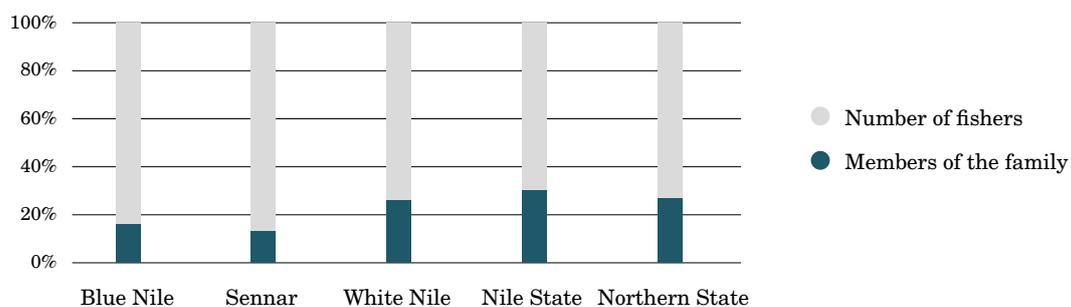


Figure 6. Household access to electricity

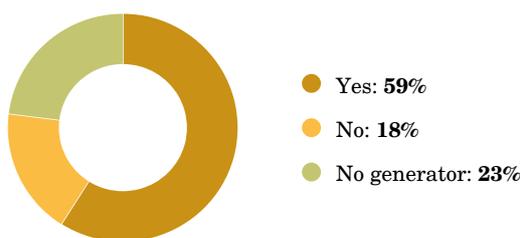


Figure 7. Household access to running water



An exploration of the results by state and village (Figure 9 and Figure 10) demonstrates how much the results varied, both within and between villages and states. By state, food as a household expenditure is highest in Blue Nile State (47 percent of total household expenditure). This is fairly consistent across the four village focus groups, with a range of between 44 and 52 percent in total. Households in Blue Nile State have the highest percentage expenditure on food, with the exception of Malek El Nasr in Northern State, where the focus group indicated that food comprises 58 percent of total household expenditure. Food comprises the lowest portion of household expenditure in River Nile State, where in individual villages it ranges from 18 to 26 percent.

Figure 8. Household expenditures

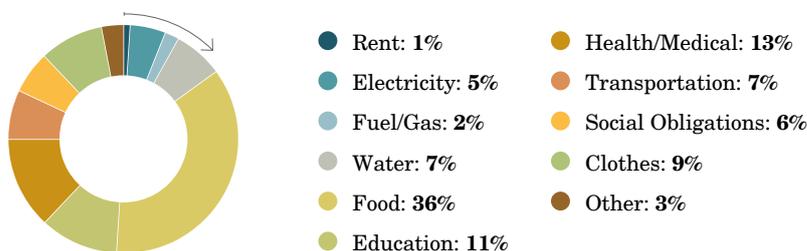
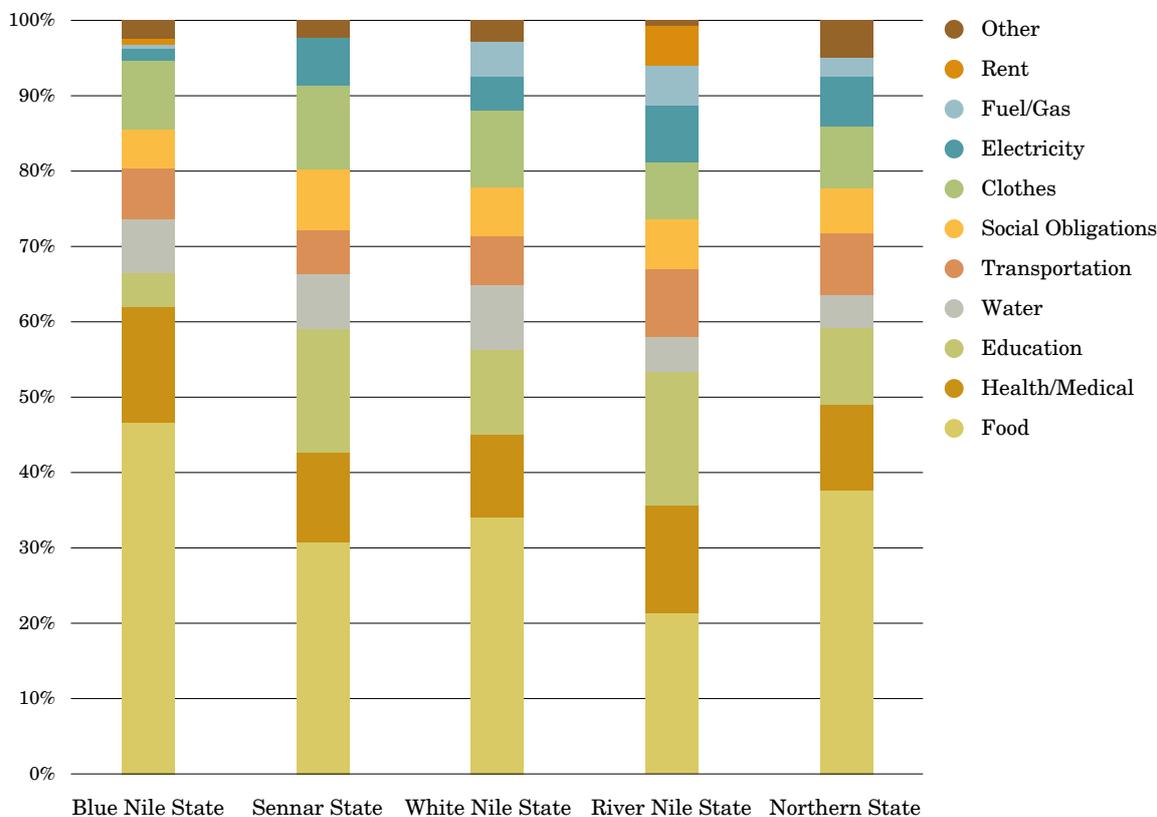


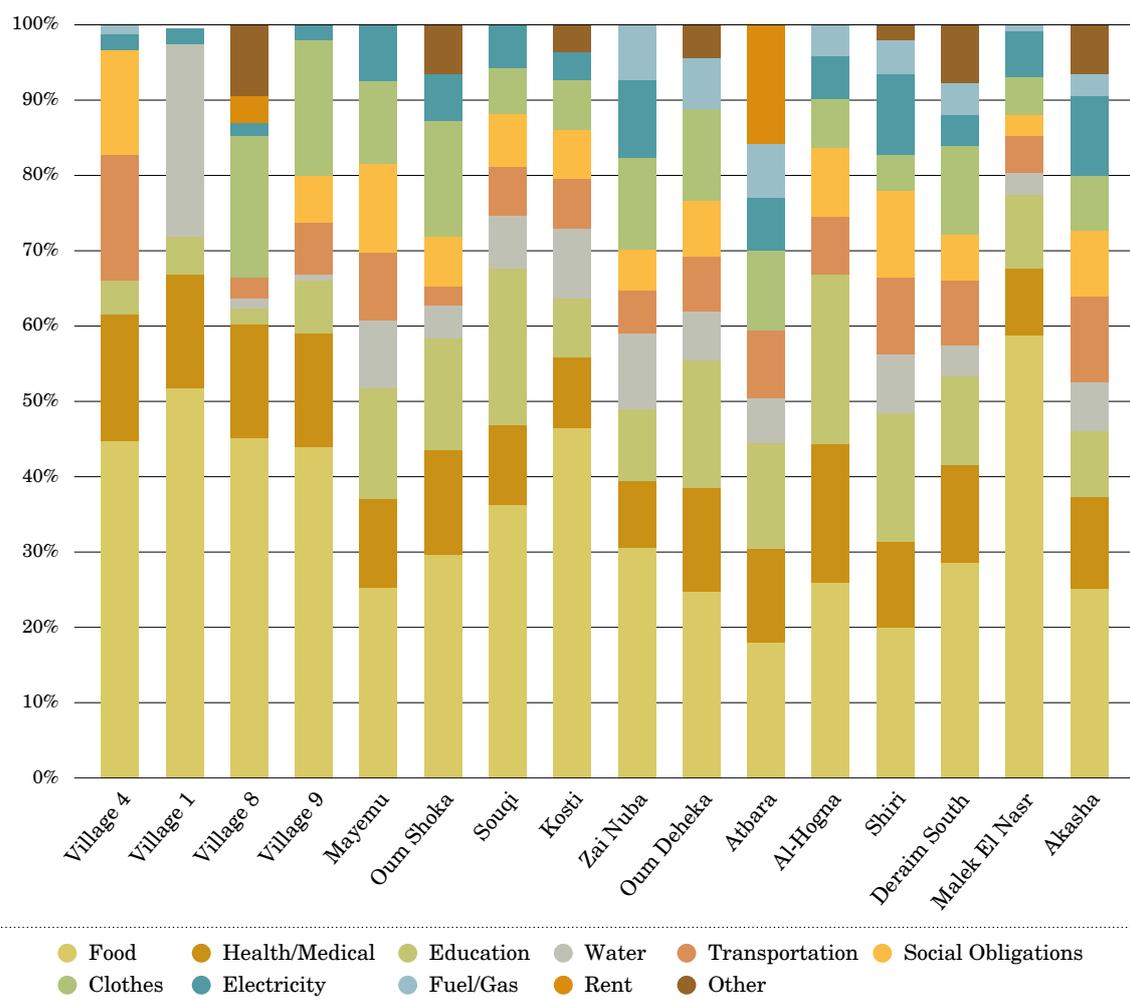
Figure 9. Household expenditures by state



Health and medical expenses are fairly consistent across villages and states, ranging from 9 to 18 percent, with an average of 13 percent. Fisher households generally pay for all their health and medical expenses with no government assistance or insurance to cover health needs. Health services are available to all study participants, through the existence of a dispensary, the presence of a medical assistant in the village or by going to another village. If more formal treatment is sought, the people in villages without dispensaries are obliged to go to neighbouring villages (a 30 minute to 2 hour drive). Three villages have assistant doctors providing expensive private services. Villagers must pay the doctor’s fee at community dispensaries. The fee varies greatly among dispensaries and the price of the medicines is not included.

Education expenditures as a proportion of total expenditures are lowest in Blue Nile State (4.5 percent) and highest in River Nile State (18 percent). In Blue Nile State, the expenditures range from two to seven percent, while in River Nile State they range from 14 to 22 percent. This could be explained by the fact that in two of the three village focus

Figure 10. Household expenditures by village

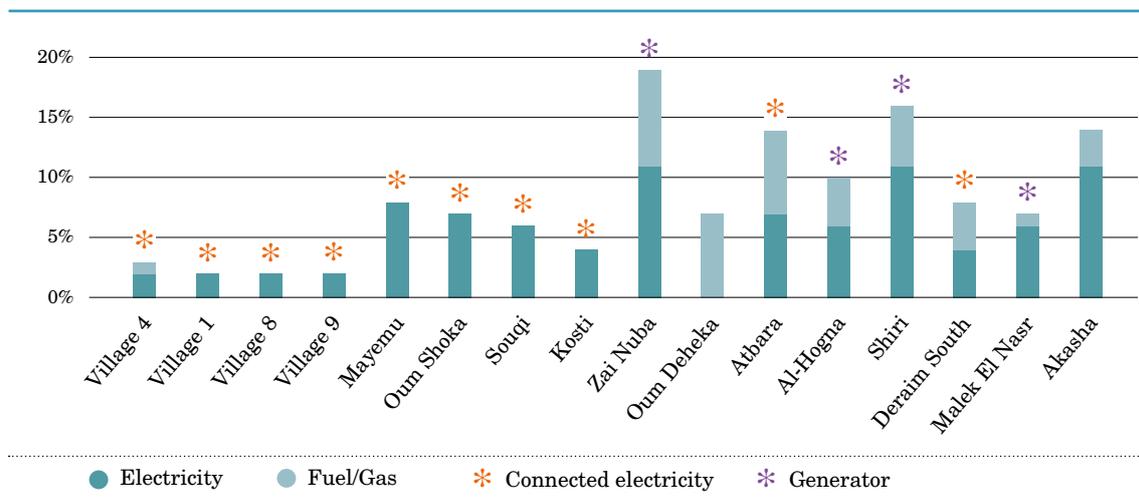


groups in River Nile State, participants indicated that their children generally attend school through university. The only other focus groups that indicated this were those in Kosti in the White Nile State and in Malek El Naser in Northern State, where expenditure on education comprises 10 percent of total household expenditures. Schools are located all along the Nile in Sudan. All the villages have elementary schools, except for two: Oum Deheka (White Nile State), where children have to walk two km, and Al-Hogna (River Nile State), where children have to sail across a dam for 15 minutes to reach their school. Education fees vary among schools and by level of education. In some schools, teachers request a yearly payment for their services. Both boys and girls from all the villages assessed go to elementary school. If the family is able to afford it, all the boys in the family go to high school. Most of the girls also go to high school, unless the school is far away and they do not have relatives near the school with whom they can stay. This is because of limitations on women’s mobility. University is accessible for wealthier families with relatives in Khartoum.

There is also a large range in the next highest expenditure item overall – clothes, ranging between zero and 18 percent. By state, this expenditure is fairly consistent, ranging between seven and 11 percent. Somewhat surprisingly, transportation expenditure is not higher for more remote villages, as was expected. This could be due to the fact that, as the remote locations are poorly served by paved roads and public transportation, transport is well-planned and minimized as much as possible in order to reduce costs.

An exploration of the type of electricity versus the percentage that electricity, fuel and gas comprise of household expenditures is briefly undertaken below in Figure 11. With the exception of two focus groups, the villages which have access to grid electricity also have electricity and fuel costs under 10 percent of their total household expenditures. For those villages which depend on generators for electricity, electricity and fuel costs range from seven to 17.5 percent of total household expenditures. Small solar energy devices are available in some villages, but those interviewed indicated that they are strong enough to charge their mobile phones.

Figure 11. Fuel and electricity costs against type of electricity



Regarding the cost of water as a proportion of household expenditures versus household access to running water, no clear relationship emerged and such costs vary greatly (Figure 12). For example, in Village 1 in Blue Nile State, because the village is so far from the source of water, the villagers pay high prices for water, as they have no choice but to purchase water. Other villages that do not have access to running water simply chose to collect it themselves for free, although this may have a significant cost in terms of time or use of household human resources.

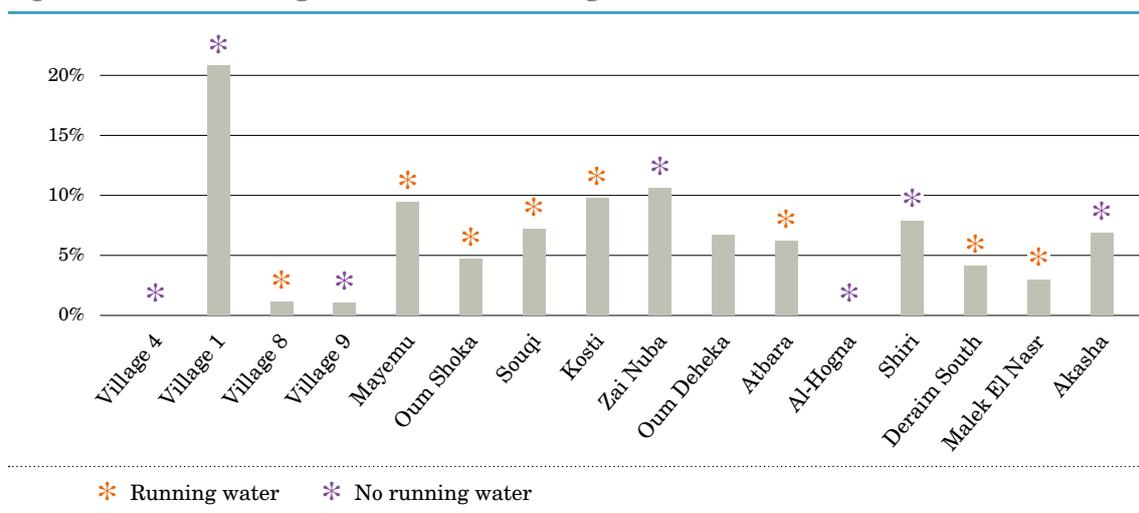
3.1.2 Household assets

Assets assessed in the study were farmland, fishing boats, fishing gear, small livestock and educated children. More than 60 percent of the focus groups indicate they have access to agricultural land. However, the size and type of access varies both between and within focus groups. For example, the size of agricultural land ranges from one to 10 *feddan*⁵ among those with access, with some indicating that they own the land and others indicating that they rent it. In terms of fishing boats and fishing gear as assets, this varies depending on the wealth of the individual fisher. Some own one boat and several nets. However, a common type of ownership consists of the fisher being provided with the boat or gear by a third party (often someone involved in purchasing fish) and repaying the third party in instalments. This sometimes affects the flexibility of the fishers with regard to who they can sell their fish to.

3.1.3 Household livelihoods

In the fisher focus groups, the number of livelihood sources that contribute income to households was discussed, as well as the percentage that each source contributes to total annual income; this in order to obtain an indication of livelihood diversity. It should be born in mind that the income contribution of each source provides an indication only of

Figure 12. Water costs against access to running water



⁵ 1 feddan / فدان = 0.42 hectares

cash income but does not necessarily indicate the importance of the livelihood source in terms of household food security or as a source of savings.

A prerequisite of the fisher focus groups was that the participants be engaged in fishing and consider themselves fishers. Unsurprisingly, 100 percent of the focus group communities are engaged in fishing. In each community focus group, households have between one and three livelihood sources that provide them cash income. Thirty-five percent of the focus groups indicated that 100 percent of the household income for fishers in their communities comes from fishing, while the remaining 65 percent indicated that they have multiple sources of cash income. Figure 13 shows the overall livelihood sources of the fishers interviewed. As noted above, 100 percent of households engage in fishing while 53 percent also engage in agriculture for cash income. Households also engage in mining and other activities for cash income. Figure 14 shows the overall contribution to household income from each livelihood source. Overall, fishing comprises 79 percent of household income, followed by agriculture (14 percent), mining, other and livestock.

Examining livelihood sources and the income contribution of each at the state level provides a clearer picture of how fishing households actually generate income, as demonstrated in figures 15 and 16. For example, in the community focus groups in Blue Nile State, 100 percent of households engage in fishing as a livelihood source, while over 70 percent also engage in agriculture. These livelihood sources comprise 64 and 28 percent of household income, respectively. While only one community focus group in Blue Nile State engages in a livelihood source listed as ‘other’, that source comprises more than 30 percent of the focus group’s total household income. The communities in Blue Nile State, where the contribution of fisheries to income is relatively low (although still more than half), contrast with the communities in White Nile State, where fishing comprises over 95 percent of household cash income. (It should be noted that 66 percent of the communities in White Nile State engage in agriculture, but primarily for subsistence and contributing less than 5 percent of household cash income). The focus group communities in the River Nile State are the only communities that derive some cash income from mining.

Figure 13. Livelihood sources of fishers interviewed

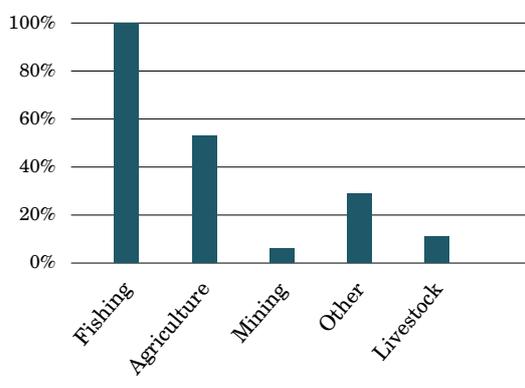


Figure 14. Income contribution of livelihood source

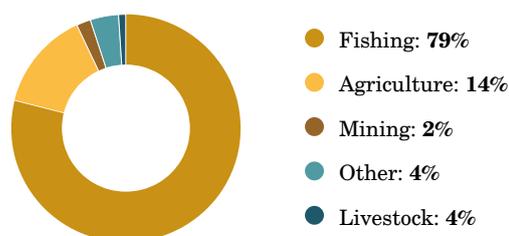


Figure 15. Household livelihood sources by state

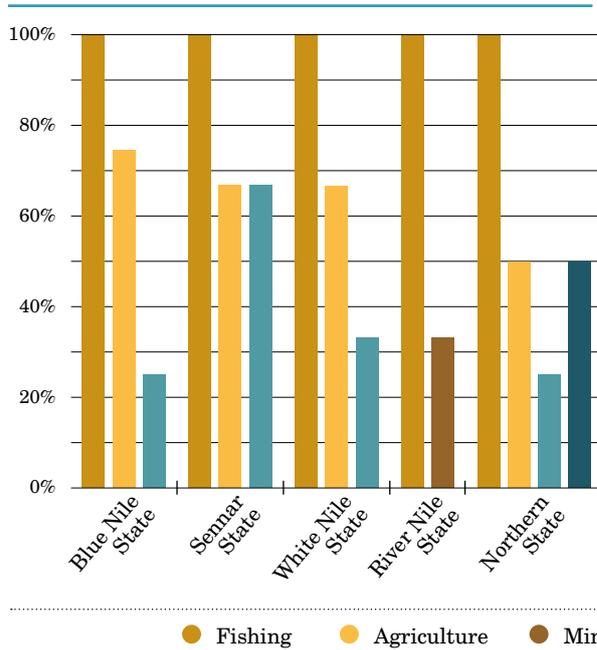
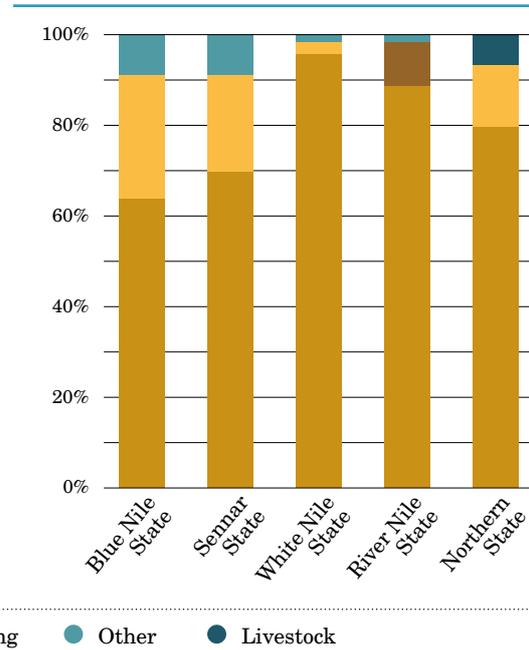


Figure 16. Household income contribution of livelihood source by state



3.2 Fishing activity

Questions on fishing activity related mainly to when people fished, what gear they used, the amount of fish caught and some economic information.

3.2.1 Fishing seasons

Focus group participants were asked to divide the year into seasons and describe when the good, poor and average fishing seasons were in order to get an overall picture of the fishing seasons in the different communities and states. As may be expected, there are no consistent, nationwide fishing seasons. Rather, general pictures for a few different areas do emerge, in particular for Blue Nile State and Sennar State and for White Nile State. Downstream from Khartoum, there is less consistency. For example, Atbara, along the Nile River, does not match well with the communities on the reservoir behind the Merowe Dam and so these are separated into two groups. In Northern State, there is consistency among the focus groups fishing on Lake Nubia, but less so among those along the Nile itself, and so these are also disaggregated. A tentative description is provided below in Table 4, which shows that, in Blue Nile, the main or good fishing season is a period of five months, from March to July. The poor fishing season (which coincides with the flood season) is a period of three months, from August to October. For the rest of the year, fishing is described as not particularly good, nor very poor (thus it is termed “average”). For White Nile State, the main fishing season lasts from November until March, similar to that of the River Nile State outside of the Merowe Reservoir (October to April), the Merowe Reservoir area (December

until March), and Northern State on the Nile (October to April). While there are variations in this information, it helps to get a picture of how long the main fishing seasons last, and assists with further questions on the main catch sizes for each season.

Table 4. Summary of fishing seasons

AREA	DESCRIPTION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
Blue Nile State and Sennar State Summary	Average fishing season	■	■									■	■
	Main/Good fishing season			■	■	■	■	■					
	Poor Fishing Season								■	■	■		
White Nile State Summary	Average fishing season				■	■	■						
	Main fishing season	■	■	■	■	■	■	■	■	■	■	■	■
	Poor fishing season							■	■	■			
River Nile State (between Khartoum and Merowe dam)	Average fishing season	■	■										■
	Main fishing season	■	■	■	■	■	■	■	■	■	■	■	■
	Poor fishing season							■	■	■			
Merowe Dam (Shiri and Al-Hogna)	Average fishing season				■	■	■	■		■	■	■	
	Main fishing season	■	■	■	■	■	■	■	■	■	■	■	■
	Poor fishing season							■	■				
Northern State (between Merowe Dam and Lake Nubia)	Average fishing season					■	■	■	■	■			
	Main fishing season	■	■	■	■	■	■	■	■	■	■	■	■
	Poor fishing season	■	■	■				■	■	■	■	■	■
Lake Nubia	Average fishing season				■	■	■						
	Main fishing season		■	■	■	■	■	■	■	■	■		
	Poor fishing season	■				■	■					■	■

3.2.2 Fishing vessels and gear

Of the focus groups interviewed, 100 percent use oar powered boats. The type of boats tend to vary by village, as demonstrated below in Table 5. The main vessel types used are *sharoaq*, *feluka* and *murkab al hadeed* (see figures 17, 18 and 19, respectively). From the focus group discussions, it emerged that in the states upstream of Khartoum, along both the Blue Nile and the White Nile, the more common vessels are *sharoaq* and *feluka*, whereas north of Khartoum the *murkab al hadeed* is more common.

In terms of fishing gear, this also varies by village and state. A brief description of each type of gear is provided in Table 6 below.

The results of the information collected on the most frequently used fishing gear are set forth below in Figure 20. Overall, the types of fishing gear used most frequently are the *rami* (a fixed net) and the *sareema* (a long line). These are followed by the cast net, locally called *tarraha*; the fixed net, locally called *oum koubouk*, and a mixture of other types of gear. A closer look at the results by state show that fishers either use the *rami* or the *oum*

3. Results of the assessment

Table 5. Vessel type

	BLUE NILE STATE				SENNAR STATE			WHITE NILE STATE			RIVER NILE STATE			NORTHERN STATE		
	Village 4	Village 1	Village 8	Village 9	Mayernu	Oum Shoka	Souqi	Kosti	Zai Nuba	Oum Deheka	Atbara	Al-Hogna	Shiri	Degaim South	Malek Al Naser	Akasha
Sharraq/Feluka - شروق/فلوكة	*		*		*			*								
Sharraq - شروق		*				*		*	*							
Feluka - فلوكة				*												
Murkab Al Hadeed - مركب الحديد											*	*	*	*	*	*

Figure 17. Sharraq vessel, Sennar state



©FAO/Paula Anton

Figure 18. Feluka vessel, Sudan



©FAO/Paula Anton

Figure 19. Murkab Al-Hadeed vessel, Northern State



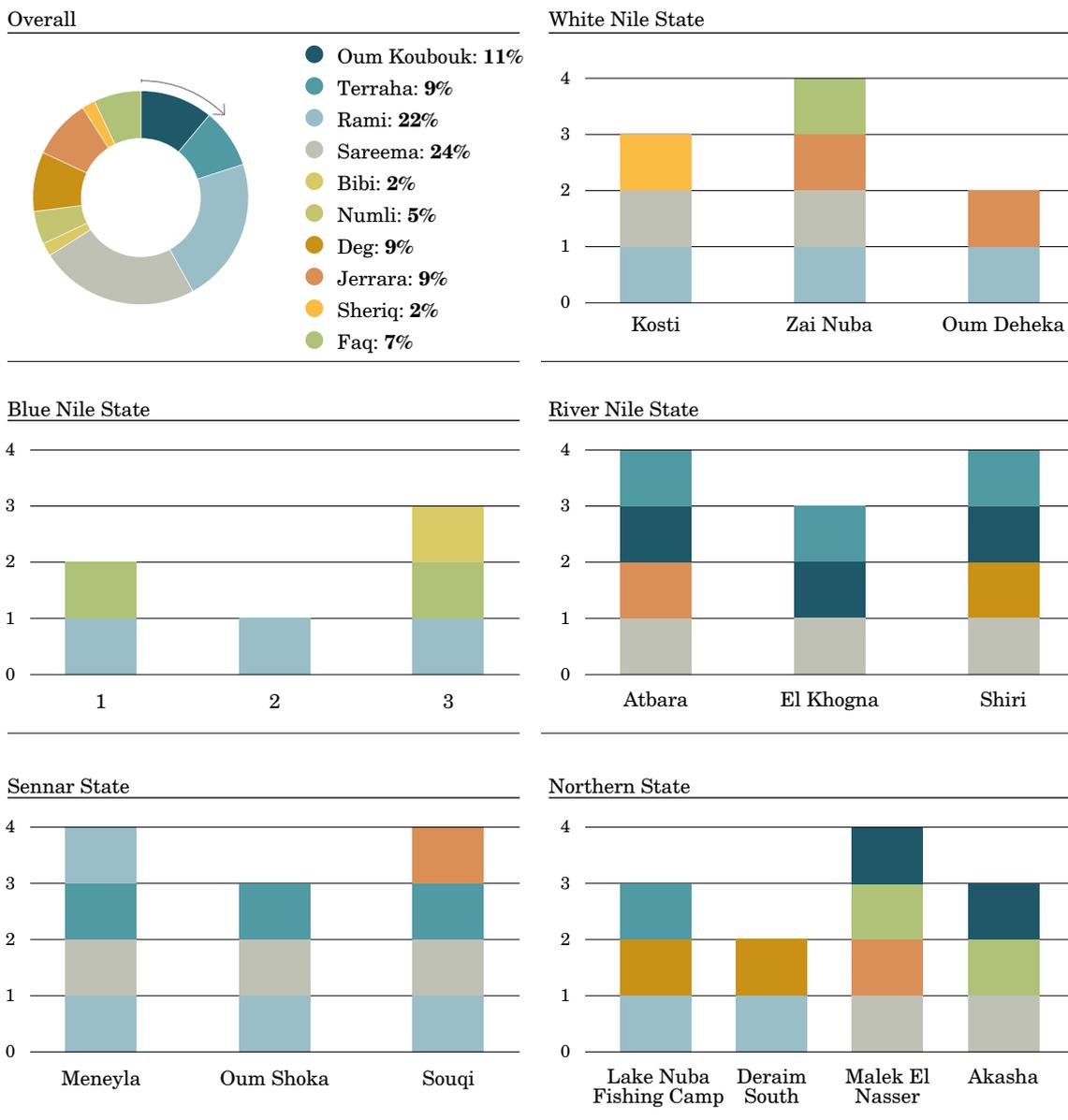
©FAO/Paula Anton

Table 6. Brief description of fishing gear used

TYPE OF FISHING GEAR	LOCAL NAME	TWINE	MESH SIZE (CM) OR HOOK NUMBER FOR LONG LINES
Fixed Net	Rami / رمي	Multifilament	6-12 cm
Fixed Net	Oum Koubouk / أم كبك	Multifilament	64-90 cm
Trammel Net	Mowashasha / موششة	Monofilament	12-18 cm
Drift Net	Faq / فك	Monofilament	6-10 cm
Seine Net	Bibi / بببي	Monofilament	2-4 cm
Cast Net	Tarraha / طراحة	Multifilament	2-10 cm
Long-line	Sareema / صريمة	Multifilament	150-300 hooks
Long-line	Jago / جقو	Multifilament	50 hooks

Source: Mohamed & Ali, 2011

Figure 20. Fishing gear used by fishers



koubouk and that these were identified as the main fishing gear, followed by the *sareema*. In many cases, two types of fishing gear are used on each boat.

In terms of the number of fishers in each boat, generally this ranges between one and three, although in some villages this changes depending on the fishing season (Figure 21). In many cases, focus groups indicated a range of two to three fishers per boat, in which case 2.5 was used as the indicative number.

Depending on the village, fishers make fishing trips between three and seven days per week. Most villages fish daily, consistently throughout the year, regardless of the fishing season. However, three villages fish less frequently during the poorer fishing seasons (Figure 22).

3.2.3 Fish catch

Regarding the amount of fish caught, information was provided by the fishers on what an average, good and poor catch size is in each season, in order to get a range of catch sizes. Information was also provided on how the catch is divided between the crew. Generally, when there are two fishers per boat, one-third of the catch is set aside for the boat owner and each fisher also receives one-third. In this case, a fisher who is not a boat owner,

Figure 21. Number of fishers per boat

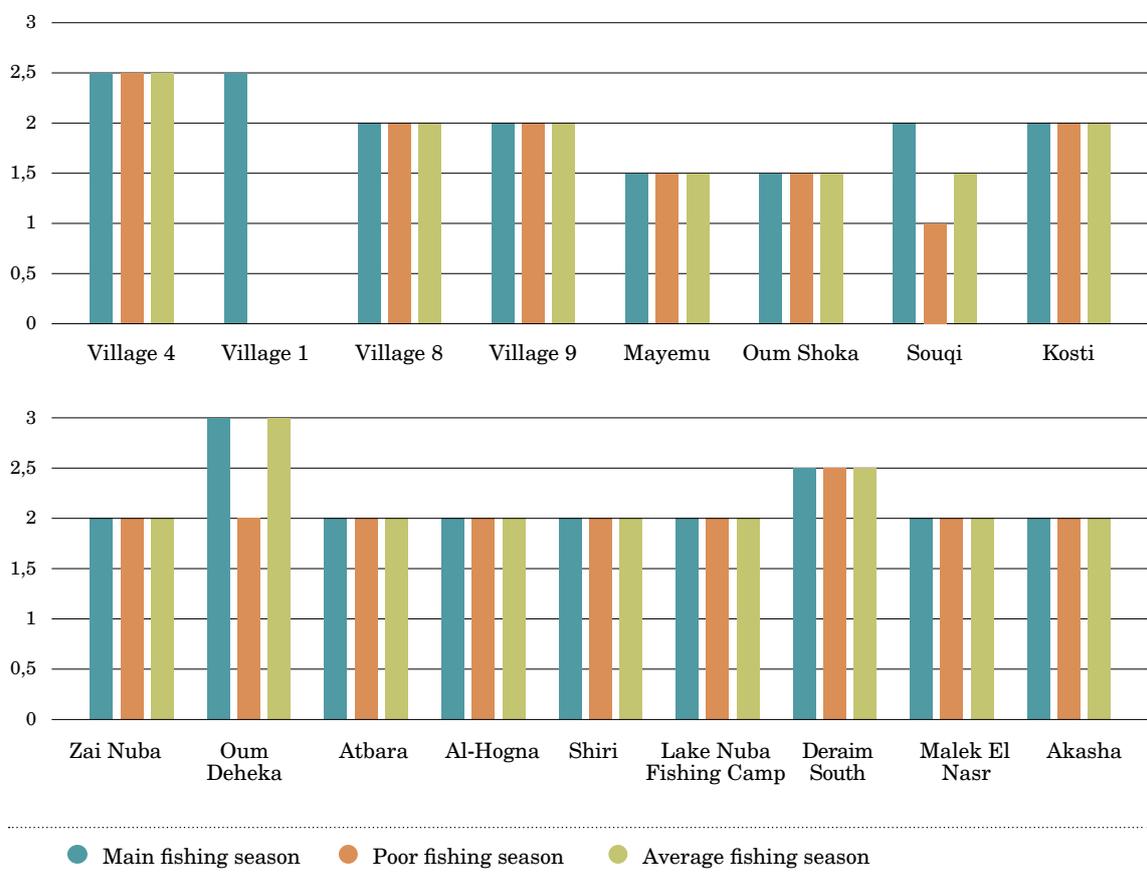
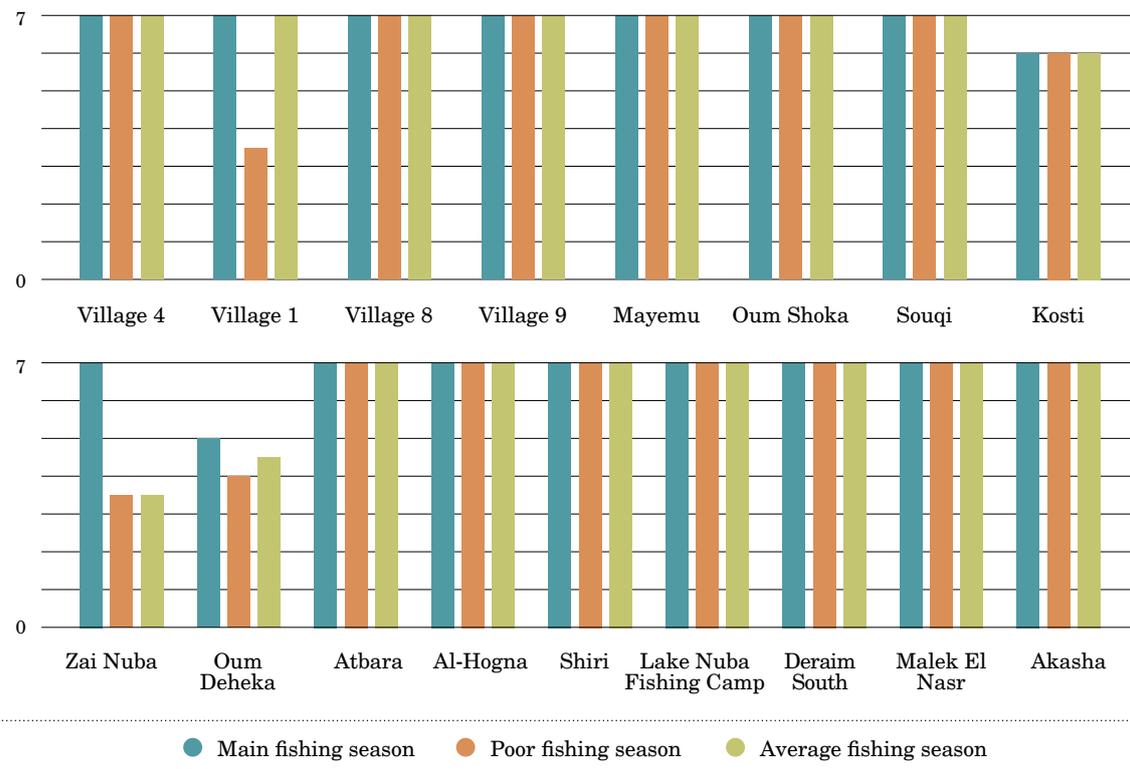


Figure 22. Number of fishing days per week



fishing in Blue Nile State during the main fishing season, can expect to take home eight kg of fish per day to consume or sell, while a fisher in Northern State, during the main fishing season, will likely take home 20 kg of fish per day. The average daily fish catch for a boat in each state is detailed below in Figure 23. The figures used to create this chart represent an average of the average catches of each village.

It is important to note the range in fish catch within any given season as fishers often live day to day with little savings and the variation experienced in their livelihoods demonstrates the potential for instability or, at least, uncertainty. In addition to the average catch, fishers were also asked what comprised a poor and good catch during each season. Figure 24 shows the range during the main fishing season. On average, fishers on a single boat can expect a range between a poor catch of 10 kg and good catch of 50 kg in Blue Nile State, and between 25 kg and 120 kg in Northern State.

Figures 25 and 26 also show the range of fish catch in poor and average fishing seasons. In the poor fishing season, when it may be assumed that households (particularly those that rely most heavily on fishing as a livelihood source) face more difficult conditions, the daily variation may be more important. For example, if a fisher is only able to take home between one and five kg of fish, as appears to be the case in Blue Nile State, this not only affects the income of the household, but also the food security, as one kg of fish is likely not be sufficient for the daily food needs of the family.

3. Results of the assessment

Figure 23. Average daily fish catch per boat by fishing season and state

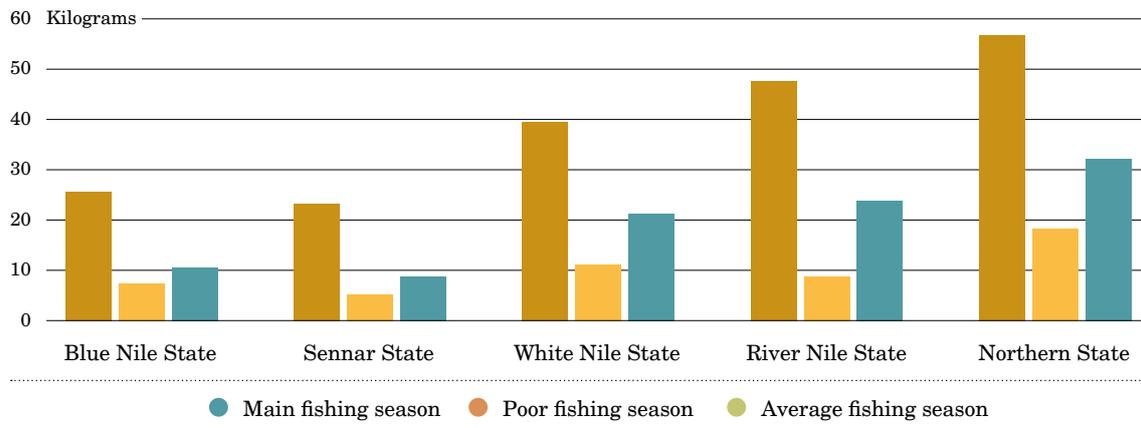


Figure 24. Range of daily fish catch by state during the main fishing season

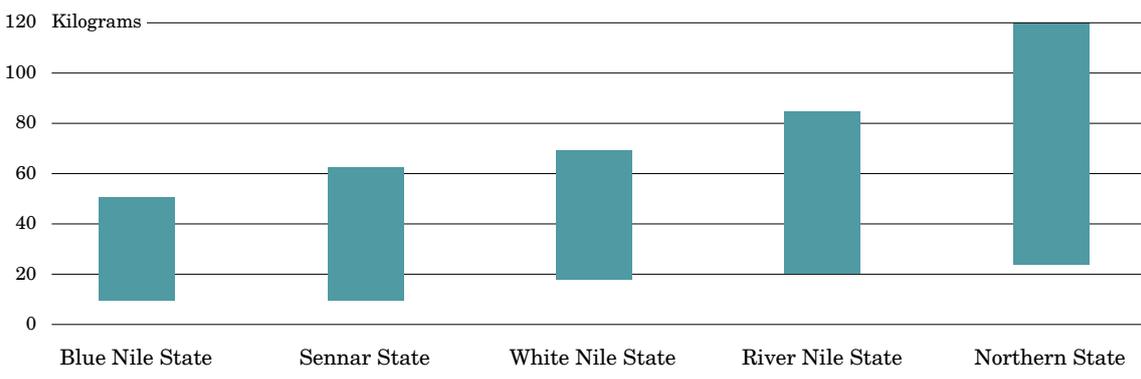


Figure 25. Range of daily fish catch by state during poor fishing season

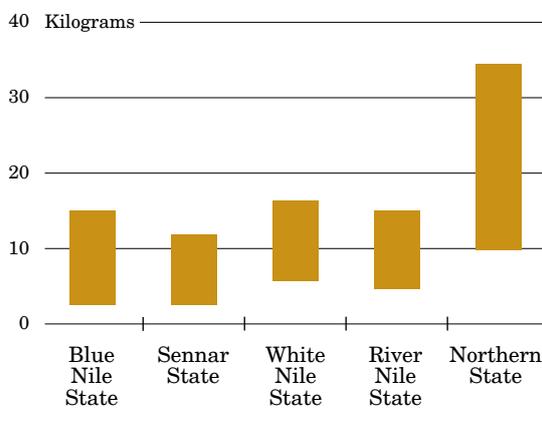
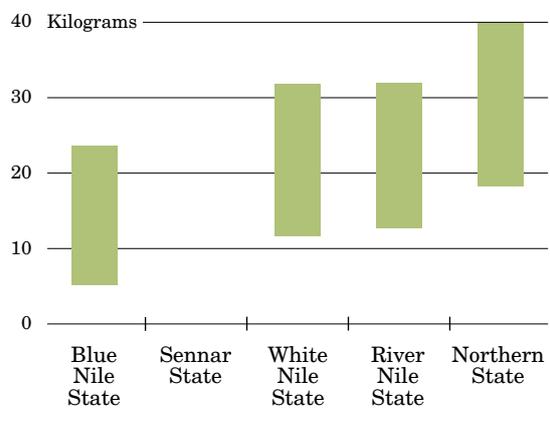


Figure 26. Range of daily fish catch by state during average fishing season



3.2.4 Catch composition

Information was also gathered on the type of fish caught. For the main fishing season, more detailed information was collected on the type of fish caught and estimates were made of the percentages of each species in the total fish catch. For the poor and average fishing seasons, the species present in the fish catch was gathered, but not the percentage of the total catch. Overall, focus groups mentioned thirteen types of fish as the main fish species caught. Table 7 details this information, including the local name in Arabic and its transliteration, the common name in English (when available) and the scientific name.

Table 7. Main fish species identified as fish catch

ARABIC/LOCAL NAME	TRANSLITERATION	ENGLISH COMMON NAME	SCIENTIFIC NAME
العجل	Ijil	Nile perch	<i>Lates niloticus</i>
البياض	Bayad	Bayad / Bagrid catfish / Black Nile catfish	<i>Bagrus bayad</i>
الكبروس	Kabaross	Semutundu / Sudan catfish / Silver catfish	<i>Bagrus docmac</i>
دبس	Dabis	Nile carp	<i>Labeo niloticus</i>
بني	Bini	Barbus fish	<i>Barbus bynni</i>
قرقور	Gargoor	Wahrindi	<i>Synodontis schall</i>
خشم البنات	Khashm albanat	Elephant snout	<i>Mormyrus niloticus</i>
الكاس	Kas	Elongate tigerfish	<i>Hydrocynus forskalii</i>
الكوارة	Kawara (or Seera)	Characin / Nile robber	<i>Alestes dentex</i>
البطي	Bolti	Tilapias	<i>Oreochromis, Sarotherodon and Tilapia sp.</i>
القرموط	Garmoot	North African catfish	<i>Clarias gariepinus</i>
شلباية	Shilbaya	Silver catfish / African butter catfish	<i>Schilbe intermedius / uranoscopus / mystus</i>
سرتة	Serta	African catfish	<i>Heterobranchus bidorsalis</i>
تامبيرة	Tambeera	Globefish / Nile puffer fish	<i>Tetraodon lineatus (synonym: Tetraodon fahaka)</i>
بردة	Oum jerrig / Barada	Electric catfish	<i>Malapterurus electricus</i>
ساويا	Sawiya	Elephant fish	<i>Hyperopisus bebe</i>

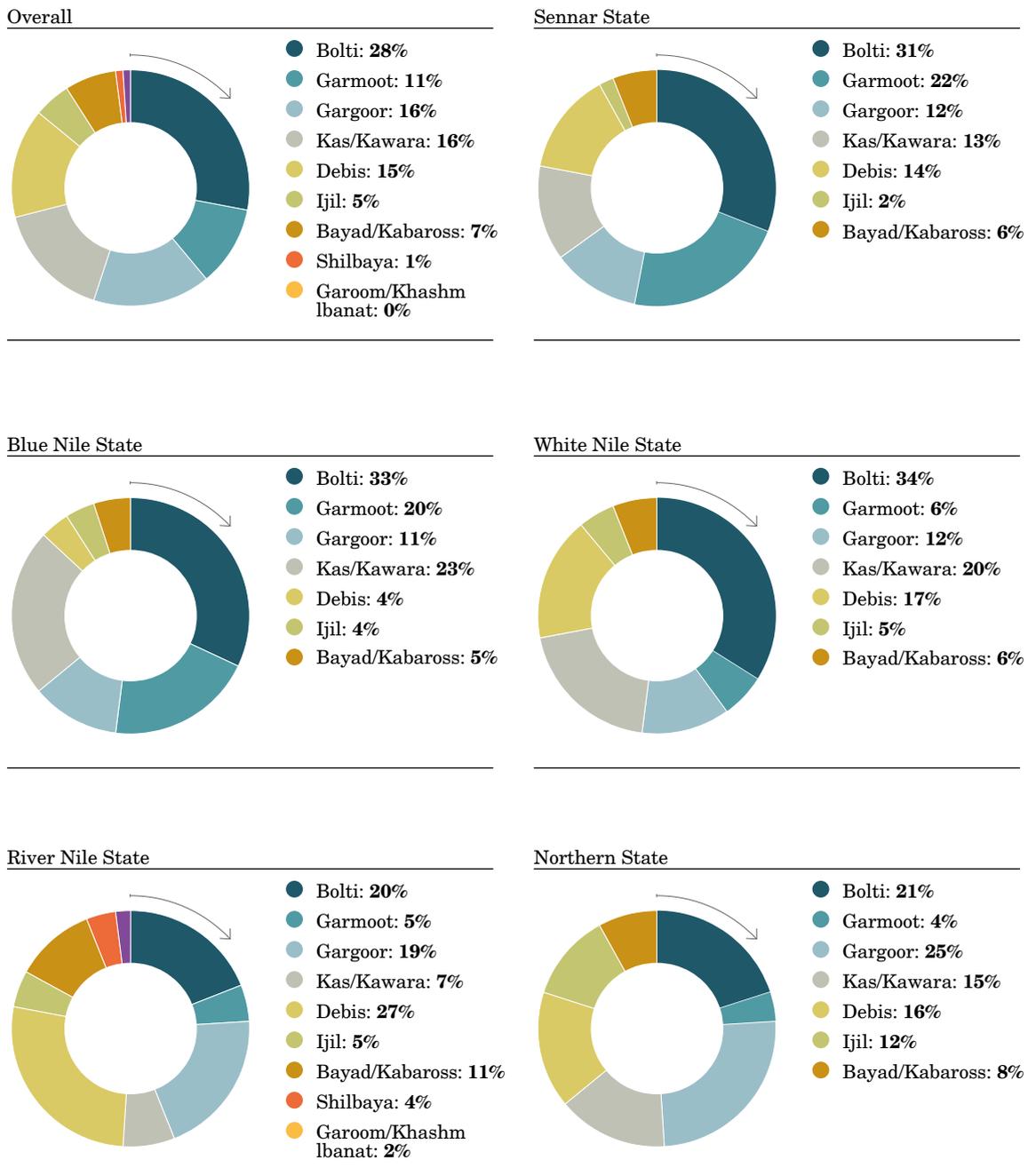


Cooking fish in the Souqi's market, Sennar state

©FAO/Paula Anton

Overall, the catch composition of the focus group communities reveals that the most commonly caught fish in the main fishing season is *bolti*, at 28 percent, followed by *gargoor*, *kas/kawara* and *debis*, and, finally by *bayad/kabaross*. The details of the composition of the catch during the main fishing season, overall and by state, are shown below in Figure 27.

Figure 27. Composition of catch during main fishing season



Figures 28 and 29, below, detail the species comprising the fish catch in the poor and average fishing seasons. Notably, in some villages, *bolti* is not found in the poor and average seasons; in Blue Nile State, *kas* and *kawara* are not present in three of four villages during the poor fishing season; in Sennar State, *bayad* and *kabaross* are not present in the poor and average fishing seasons, while they comprised six percent of fish catch in the main fishing season. *Ijil* is not present in fish catch in White Nile State during the poor fishing season, and is present in only one village in the average fishing season. In Sennar State, *Ijil* is not present in the fish catch in any villages during the poor and average fishing seasons. The information provided regarding the fish species that comprise the catches in different seasons should assist in any interventions with regards to the gear required and with regards to marketing the fish.

Figure 28. Composition of catch in poor fishing season

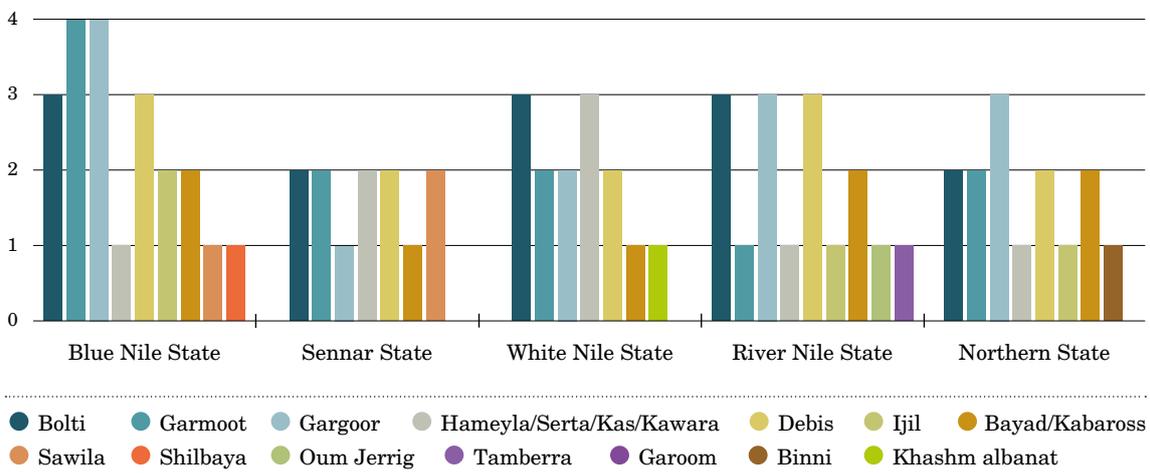
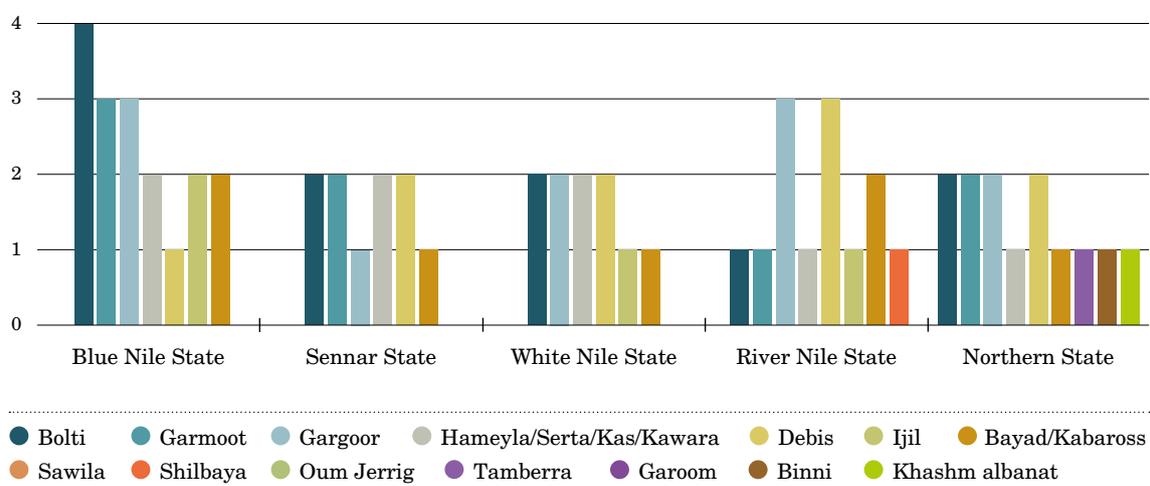


Figure 29. Composition of catch in average fishing season



3.2.5 Sales of catch

Information was also gathered on the percentage of fish catch that was consumed by the households and the percentage that was sold. Changes in behaviour in this regard, depending on whether the catch is good, average or poor, were also examined. When the catch is considered ‘average’, between three and 25 percent of the catch is consumed. In the case of a good catch, between one and 13 percent is consumed and in the case of a poor catch, zero to 33 percent of total catch is consumed (Figure 30). This is likely because the number of kilograms consumed generally remain the same, as households do not necessarily consume more when the catch size is greater. Households may have a maximum amount of fish that they desire to eat on a given day, regardless of catch size. In Northern State and White Nile State, when catch size is poor, the fishers opt to sell 100 percent of their catch as they consider that the cash income is more valuable than the food.

Fishers were also asked about demand for their fish, whether or not they are able to sell all of their fish and where they sell their catch. Twenty-seven percent of the focus groups responded that they usually can sell all of their catch and 73 percent indicated that they are always able to sell all of their catch (Figure 31). In the cases where they are usually able to sell all their catch, the reasons that the fishers gave for the rare instances in which they are not able to sell all their fish included the trader not having enough ice to be able to buy it all and fishers themselves not having enough ice to preserve the fish before selling it.

Figure 30. Catch consumption vs sales

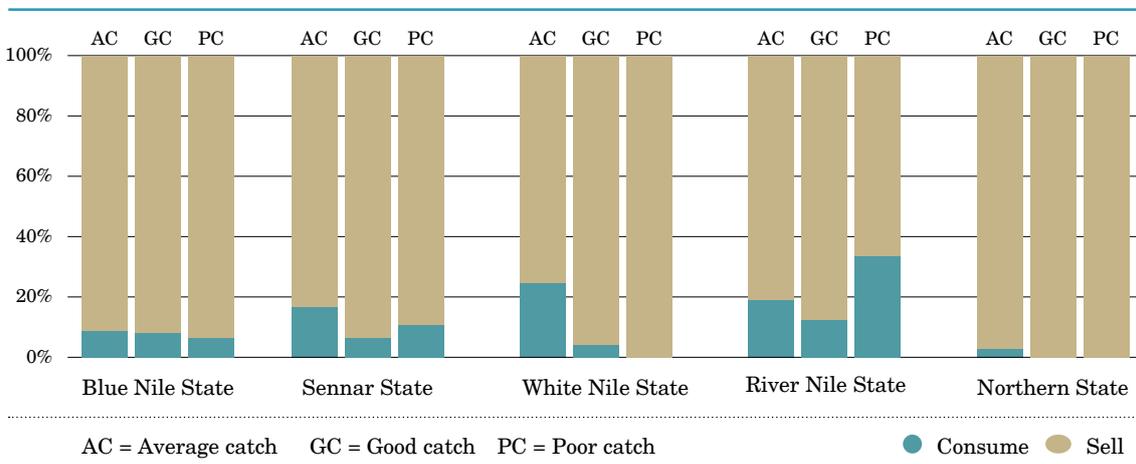
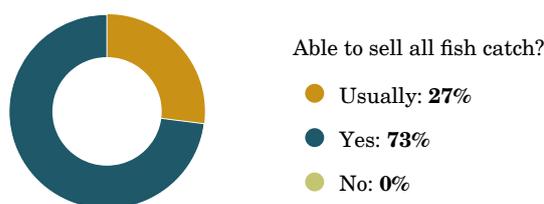


Figure 31. Demand for fish catch



Information on where the fishers sell their fish was also gathered. On average, fishers sell their fish at 1.5 locations, although this varies from village to village and according to how remote the villages are. The maximum number of places in which any given village sells their fish is three, while the minimum is one. Figure 32, below, details this information by state. In Blue Nile State, all the villages sell their catch to a trader at the landing site, while one village also mentioned selling fish door to door in their village. In Sennar State, villages use both the landing site and the market, while in White Nile State, the landing site, market and restaurants are all cited as locations to sell their catch. In River Nile State, traders come to the landing site and fish are also sold at markets. In Northern State, landing sites, traders at fishing camps, restaurants and traders at landing sites are all used as sales points. It is useful to note that in some states, villages have more options for selling their fish due to their proximity to a nearby city or town and to the existence of paved roads. Other, more remote locations rely almost exclusively on traders at landing sites.

Information was collected on whether any preservation method is used, and if so, which type (Figure 33). In Blue Nile and Sennar states, all the villages sell their fish fresh and

Figure 32. Sales location of catch

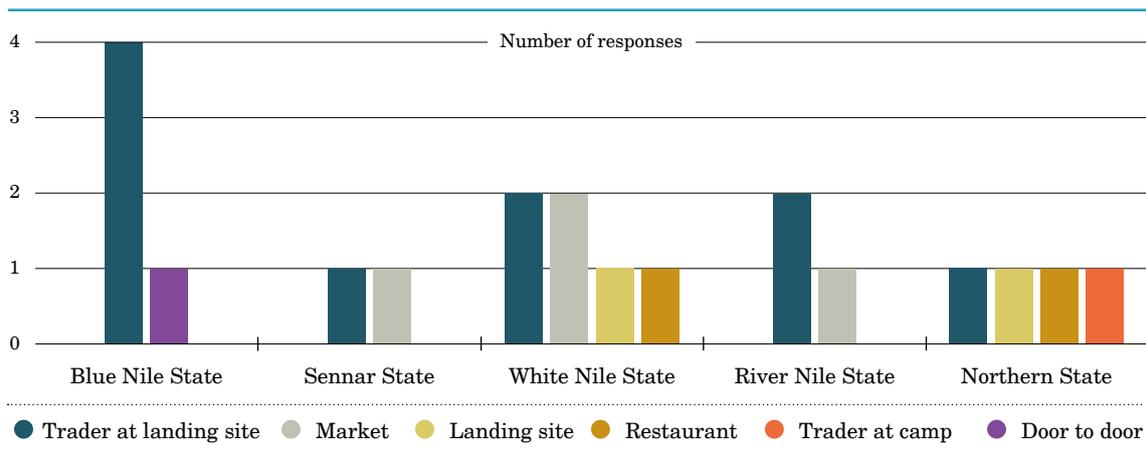
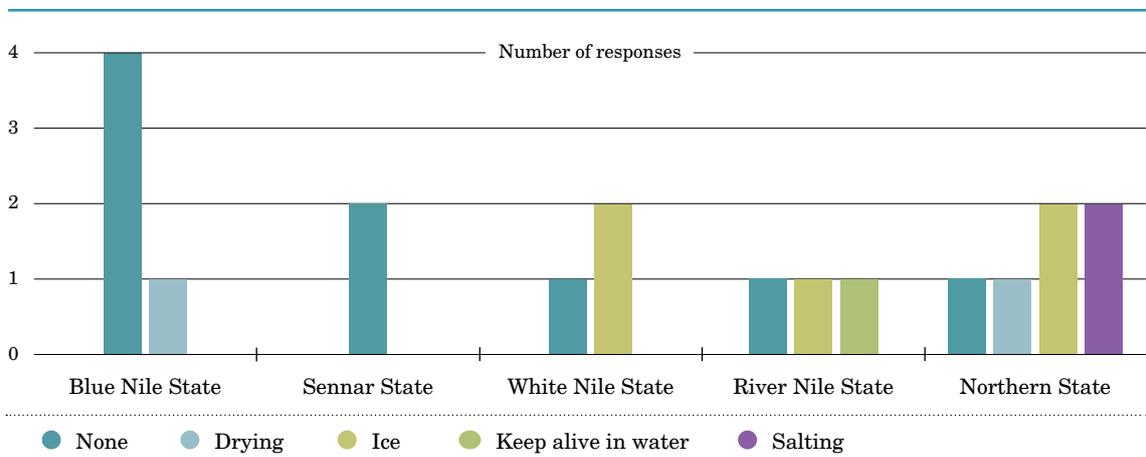


Figure 33. Frequency and method of fish preservation



use no form of preservation, except for one village where they sometimes dry their fish. In White Nile State, the fishers either do not use any preservation method or they use ice. In River Nile State, the fish is either sold fresh, kept on ice or kept alive in water. Salting is also used by some villages in Northern State, to make *feseekh*. *Feseekh* is made in a number of states, but not always by the fishers themselves.

Regarding the price that fishers receive for fish, two main answers emerged from focus group discussions. In 80 percent of villages, the price is determined by the trader. Fishers in Blue Nile State noted that there is little they can do to negotiate the price, and the only other option is to sell directly to the community. However, the demand is not high enough for fishers to do this regularly and for them to be able to sell all their catch. In Sennar State, the fishers also noted that traders determine the price, but also mentioned that when supply is low fishers may have more power in the negotiation process. In White Nile State, fishers seem to determine where they sell their catch (trader or market) based on the price they can get for the fish. If they feel that the price offered by the trader is too low, they take the fish directly to the market where they can get a higher price. In River Nile State, prices are determined by the trader; however, for fishers in Atbara, which has a fish market, fishers said they take their fish directly to the market if the price offered by traders is too low. In two more remote villages, taking the fish to the market is not an option and the only negotiating power they have is if there are more traders. In Northern State, the trader also determines the price, but fishers can negotiate and some have access to other places to sell. Fishers also noted that if fish supply is low, they have more negotiating power.

Fishers were asked if they felt they have any power to determine the price they received for their fish. All but one village said that they do not have such power, that the price of fish is determined by the trader, and that, to some extent, supply can impact the price.

Additionally, the main aspects that fishers believe to be obstacles for getting higher prices include limited transport and roads, limited selling options, lack of access to markets, and no access to cold storage.

3.2.6 Household consumption

The assessment found that mealtimes are the times when all the members of the household are together. As such, meals are a very important daily event and are compulsory for all the members of the household, at least once per day. The agreement of the information obtained in this regard from the fishers focus groups and from the women's groups proved the importance of this daily meal together. Comprising this important meal, meals are cooked, per average, between two and three times per day, and the family eats, per average, from one to two meals per day (Figure 34).

During high season, in Blue Nile and River Nile states, fish is cooked seven days per week. In Northern, White Nile and Sennar states, weekly fish consumption decreases, ranging from one to six, perhaps due to the fact that they export part of their catches to Khartoum and less is kept in the area for local consumption (Figure 35).

Figure 34. Average number of times that meals are cooked and eaten per day in the household, by state

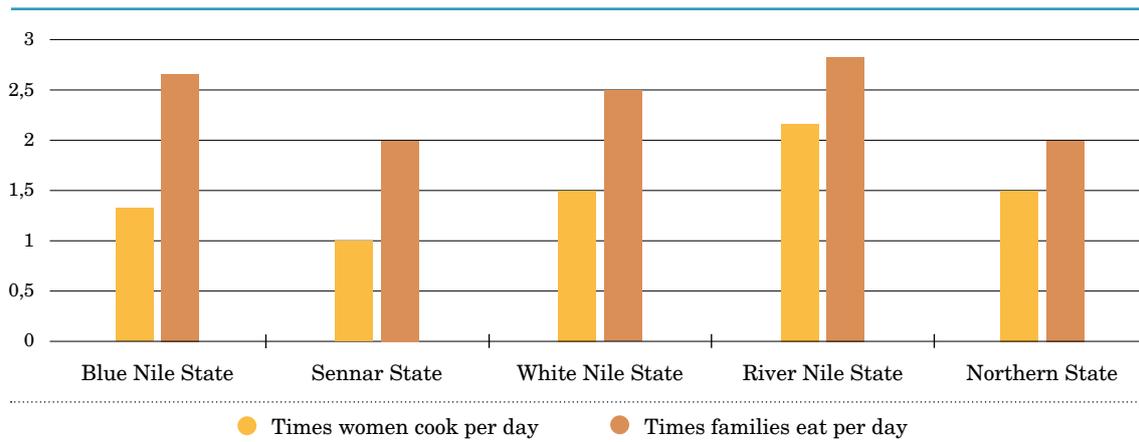
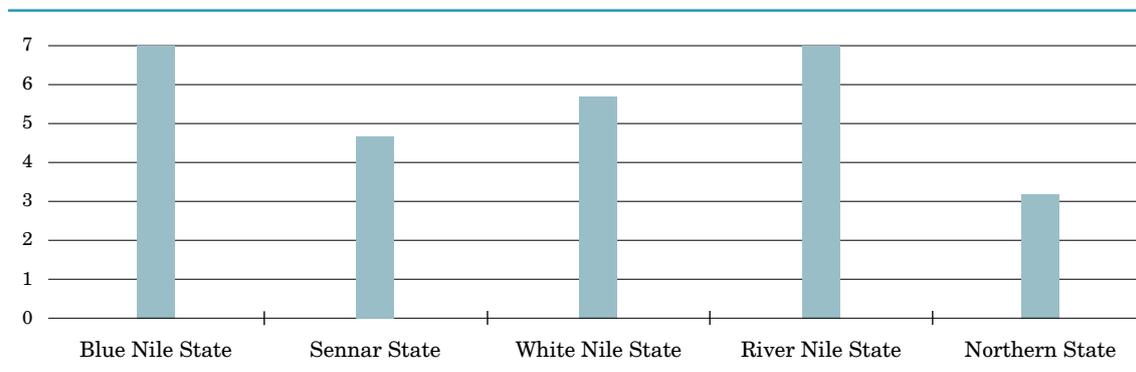


Figure 35. Average number of days per week fish is cooked in the different states during high season

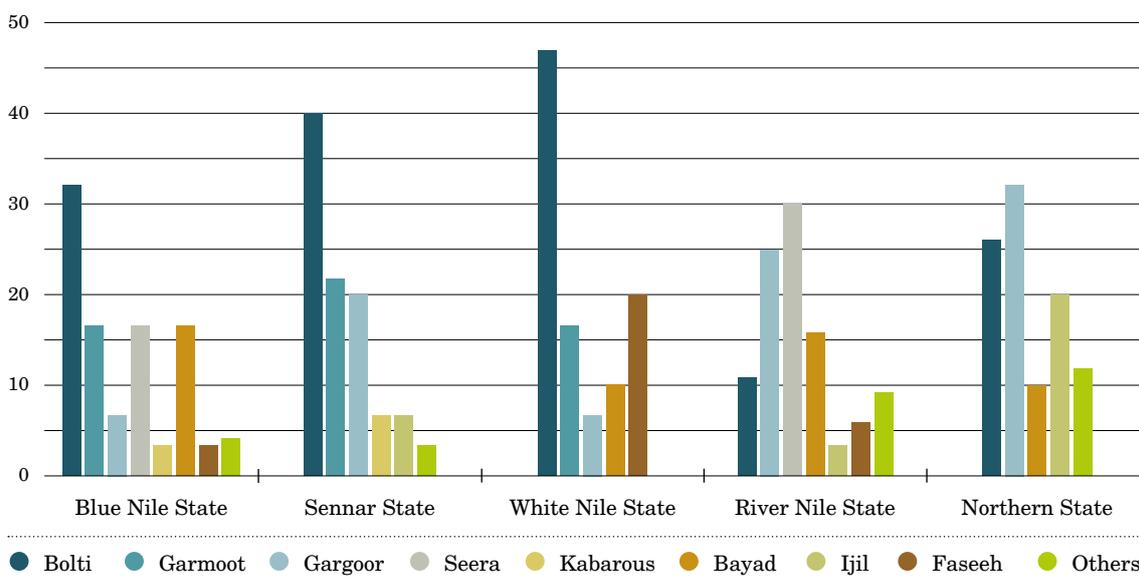


From one to two kilograms of fish are cooked per meal. Households with more fishers can cook up to three kilograms per meal, while households with less fishers usually cook less than two kilograms. The rest of meals or dishes comprise mainly vegetables. Meat is rare and unaffordable for most of the families. The preference of fish over meat is unanimous among all the focus groups interviewed.

Fish is generally cooked as soup, fried or cooked with vegetables (tomato, onions, etc.) with some clear particularities in some regions. In the north of Khartoum (Northern and Nile states), soup is not so common and *feseekh* (salted fish) is omnipresent, mainly during poor fishing seasons.

Most of the families do not buy fish. They mainly keep the smallest sized and ugliest fish of their catches for their own consumption. If the fish is bought, price is the principal selection criteria and quality is the second. *Bolti*, *gargoor*, *garmoot*, *bayad* and *seera* and the species used to make *feseekh* (salted fish made with *kas*, *kawara* and *debis*), are, in order of preference, the most consumed and favourite fish in most households (Figure 36), with some differences among states, mainly due to the shortage of the species in the area. For example, the consumption of catfish in Northern State is lower than in the rest of the states.

Figure 36. Composition of fish consumed per state



3.3 Involvement of women in the inland fisheries sector

Information on the role of women in the Sudanese inland fishing communities was collected through women's focus group interviews. A women's focus group was organized in each village with a total participation of 150 women from 17 different villages in five states (Blue Nile, Sennar, White Nile, Nile and Northern states). The following information is based on responses to the questionnaire used in the women's focus groups and on relevant informal conversations with women and key-stakeholders with rich local knowledge. Information from Khartoum State is scarce due to the lack of women's focus groups there.

All the women interviewed agreed that their domestic and family care tasks are to cook, clean, wash, care for children, care for their husbands and maintain family vegetable plots (subsistence production).

In Sudan, family responsibilities and subsistence tasks reduce women's availability to participate in fishing activities. However, all the women in the villages studied are involved in the fisheries sector, although there is great variation, by village and governorate, in their level of involvement and in the way in which they are involved (Table 8).

Women from all the focus groups stated that they support their husbands, when needed. This includes activities inside the household, fixing nets and cleaning and processing the fish. Only in one village, Oum Deheka in White Nile State, women help only by cooking the fish. In three villages, Village 8 in Blue Nile State, Kosti in White Nile State and Koika in Northern State, women participate with their husbands or male family members in net making activities (Figure 37). Women fish sellers were found only in two villages, Zai Nuba in White Nile State and Al-Hogna in River Nile State.

Figure 37. Woman making nets in Koika, Northern State



©FAO/Paula Anton

In some villages in Khartoum, River Nile and Northern states, few women are directly involved in production (in catching the fish themselves), mainly due to the lack of a male as head of household. Most of these women are widows or women in families in which the male head of the family has died. The critical situation of these women, obligated to generate more income for the subsistence of their families, allows them to be more involved in and have more access to fishery activities. These women are involved in activities such as making and repairing gear, selling fresh or processed fish and even catching fish or managing a fish restaurant. Nevertheless, women cannot be owners of facilities, boats and gear, and, therefore, remain dependent on male relatives for their businesses.

Women from the studied inland fishing communities, in general, do not carry out any activity outside the household, other than mandatory social responsibilities of visiting relatives a few times per year during festivities and in cases of illness or death. There are no differences in this regard by area, but there are significant differences by educational level. Women with higher levels of education were more active outside the household and have their own sources of income. Throughout the country, in each focus group, a small number of women with a higher level of education perform activities such as shopping, selling, gardening and voluntary community work, and some of them even have jobs outside the home.

The level of education of the women interviewed was very diverse among the various villages. Almost all women have attended elementary school. Only in five villages (Village 4 in Blue Nile State, Oum Shawka and Souqi in Sennar State, Oum Deheka in White Nile

Table 8. Women's involvement in fishery activities in the different villages

STATE	VILLAGE	CLEANING / PROCESSING	FIXING NETS	MAKING NETS	SELLING FISH	FISHING
Blue Nile State	Village 4	x	x			
	Village 1	x	x			
	Village 8	x	x	x		
	Village 9	x	x			
Sennar State	Mayernu	x	x			
	Oum Shawka	x	x			
	Souqi	x	x			
White Nile State	Kosti	x	x	x		
	Zai Nuba	x	x		x	
	Oum Deheka	x				
River Nile State	Atbara	x	x			x
	Al-Hogna	x	x		x	x
	Shiri	x	x			x
Northern State	Degaim South	x	x			
	Malek El Naser	x	x			
	Akasha	x	x			
	Koika	x	x	x		x

State and Malek El Naser in Northern State), are there two or three women, primarily the older women, who do not have elementary level education. Forty young women, out of 150 interviewed in all, are high school educated (four from Village 8 in Blue Nile State, two from Mayernu in Sennar State, three from Kosti in White Nile State, four from Atbara, two from Al-Hogna and three from Shiri in River Nile State, fifteen from Malek El Naser, five from Akasha and two from Koika in Northern State). Only twelve women have gone to university, one from Atbara and two from Shiri in River Nile State and six from Malek El Naser and three from Akasha in Northern State.

Financial services are not accessible to women from inland fishing communities in Sudan. They are not involved in any economic activity, unless obliged to act as head of household. They know nothing about service costs and they are rarely informed of any household accounts. Financial systems for fishers are rare, although there are some in some villages. Fishers from Village 8 in Blue Nile State (in Damazin, the biggest city of the area), from Atbara in River Nile State and from Degaim South in Northern State have access to loans from the bank, but they rarely use them as the seasonality of the fisheries makes it impossible for them to make the loan payments regularly. Men from Village 9 in Blue Nile State have been offered microloans from an NGO. In four villages, Oum el Deheka in White Nile State, Atbara and Shiri in River Nile State and Degaim South in Northern State, the fishing community is prepared to allocate emergency loans in case of fatalities. All the villages have the traditional financial service of *sambuk*, money which is collected monthly from each family and every month the whole amount is allocated to one of the families.

3.4 Post-harvest sector

The study found that the post-harvest sector along the Nile in Sudan focuses on a few products and lacks diversity in terms of opportunities for processing and selling the fish. In Nile, Blue Nile and Sennar states, captures are generally managed by local sellers and distributors and are locally consumed (only a minor amount is exported to Khartoum). In Khartoum, White Nile and Northern states, major traders usually buy and sell the fish, which is exported and sold in Khartoum markets to local sellers, retailers and restaurants. A minor proportion of the production is salted (*feseekh*), dried and sold locally or exported to Khartoum or Egypt.

The stakeholders involved in the post-harvest sector noted that fish loss and waste is an important issue in the inland fisheries sector. Large amounts of production are lost because of inadequate handling, preservation, processing, storage and distribution. Poor technical capacity regarding fish hygiene, quality, sanitation and basic fish processing technologies worsen the situation.

3.4.1 Landing sites

The assessment found that outside Khartoum, most of the landing sites are in urgent need of maintenance and of vital fishing facilities such as clean running water, ice plants, cold stores, processing units and marketing facilities. Catches are sometimes sold at the landing site, but the revenue is lower, so fishers often go themselves to the market or try to sell their products to sellers who will themselves sell it in nearby markets. Most of the catches in Northern and White Nile states are sold to traders who will export the whole lot to Khartoum. Fishers generally sell most of the catch, even if the profit is too low, in part because of the lack of storage facilities and organization among fishers, leaving them at the mercy of sellers and traders who take advantage of the situation and determine the prices of the fish.

3.4.2 Fish processing

The interviews with women and with relevant actors in the markets presented the overall situation of fish processing in the inland fisheries sector along the Nile in Sudan.

For the most part, fish is consumed fresh, with a small quantity being wet salted like *Hydrocynus sp.* (Kas), *Alestes sp.* (Kawara) and *Labeo sp.* (Debis) either for local consumption or for export; or dried in the sun. No fish canning industries exist in Sudan.

Feseekh, the traditional salted fish, which is gaining importance, is produced all along the Nile, largely in White Nile and Northern states (Figure 38). At the time of the assessment, at least one enterprise in Wadi Halfa was beginning to engage in the trade of *feseekh*, employing women for the processing work and men for the distribution process. Until now, as the owner stated, the *feseekh* enterprise in Wadi Halfa covers only 10 percent of the demand of *feseekh* in Sudan, and countries like Saudi Arabia, United Arab Emirates, Australia, and, especially, Egypt, are requesting that the product be exported.

Sun dried fish is mainly produced in Blue Nile and Sennar states (Figure 39). This product is generally commercialized in poor rural areas, which rely basically on rainfall for farming. The production of frozen fish fillets is limited to few fish exporters and is produced only when required by the costumers.

Figure 38. Local *feseekh* producer in Wadi Halfa, Norhern State



©FAO/Paula Anton

Figure 39. Local seller of dried fish in Sennar market, Sennar State



©FAO/Paula Anton

Individual processors, very often children and elders, work in all the markets and at some landing sites (figures 40 and 41). They clean, gut, fillet and chill the catches according to customer requests. The price varies depending on the quantity of fish.

In Blue Nile State, two processing plants were set up by NGOs and are being managed by women's associations. The fish is salted or sun dried. Regretfully, these processing plants are far away from the landing sites and from the market, making the women's work very difficult. The cost of transporting the fish is greater than the cost to purchase the fish, making it difficult to achieve good profits.

Figure 40. Individual processor cleaning and scaling fish at a landing site in Kosti, White Nile State



©FAO/Paula Anton

Figure 41. Market processors cleaning, scaling and gutting fish for a restaurant in Khartoum, Khartoum State



©FAO/Paula Anton

3.4.3 Fish trade within the country

The interviews with traders revealed that fish produced by inland fisheries is very important within the country. Fresh fish is transported chilled or refrigerated from the fishing grounds to the national capital and to other towns. In White Nile and Northern states, only 10-20 percent of the fish is consumed locally. The main traders are equipped with insulated trucks and iceboxes, and they deliver the entirety of their contents to Khartoum's market (Figure 42). They rarely work with the same providers and they mainly choose the fish taking in account the species, primarily *bolti* (Nile tilapia: *Oreochromis niloticus*) and *ijil* (Nile perch: *Lates niloticus*), which are the preferred and most traded species. They also choose the market where they will sell the production, depending on the species.

Traders are not organized, resulting in high levels of competition, lack of coordination, inefficient sales strategies, and, finally, economic losses due to the inevitable increase in loss and waste when the product is not sold in a timely manner. To avoid this problem, traders usually work with the same sellers, calling them while transporting the product to be able to sell it immediately once in Khartoum.

Generally, trading services in the country are inefficient and the lack of ice plants, insulated trucks and preservation facilities, contribute to wastage of a large portion of the total production. The literature review showed that fisheries trading statistics are incomplete, poor and exclusively based on minor quantities (40-100 tonnes) of fresh and salted fish (*feseekh*) (source: (Matere, 2007, table) Foreign Trade Statistics Digest, Bank of Sudan, 1991).

Figure 42. Insulated truck receiving the catches at the landing site in Wadi Halfa, Northern State for export to Khartoum



©FAO/Paula Anton

3.4.4 Marketing

The interviews with local market authorities and the Ministry of Animal Resources, Fisheries and Rangelands in Khartoum indicated that the most important fish markets along the Nile in Sudan are two major fish markets in Khartoum, which open every day and employ approximately 1 000 staff, including managers, cleaners, retailers and processors. Small fish markets can be found in the main cities in each state. The fish can be also sold in landing sites all along the Nile. There are no women in the markets (except for few street coffee sellers) and very few are seen at the landing sites.

Most of the fish from the Nile is sold in Khartoum, mainly in the two central markets and the rest is sold in restaurants, hotels, hospitals and shops. Most of the fish sold in both markets in Khartoum comes from Lake Nubia (in Northern State) and a smaller quantity comes from Sennar and White Nile states.

Interviews indicate that sellers buy the fish from traders mainly depending on specie and size. Traders may let sellers pay for the fish in two or three days, subject to a considerable price increase. Sellers, in turn, sell the product to the retailers.

According to interviews with Khartoum market authorities and relevant market actors, market associations are in place in most of the markets. The association of the biggest market in Khartoum is strong, with ten managers and approximately 1 000 staff. The association organizes the free usage and maintenance of the market facilities (including cold storage, running water, processing areas and marketing units), ensures the availability of ice for sale, manages the activities of the personnel (processors, retailers and market staff), participates in the daily price decision making for the different species of fish sold in the market, maintains records of all the inputs and outputs of fish and fish by-products in the market, and deals with the waste.

Retailers and sellers can negotiate the price of the fish, according to size and species. The prices are decided upon around five o'clock in the morning with the market association, depending on the quantity of each species, and are maintained throughout the day, until closing time when the prices may drop. However, in the end, each retailer has the freedom to decide on the price during a negotiation with the customer, mainly when supply is high or quality is poor. Sellers and retailers generally keep the fish for approximately five hours. If they do not sell it within that time, they store it in a freezer while they continue to try to sell it.

In other smaller markets, the free services are running water, electricity, processing facilities and the maintenance of the market. Users must pay cold storage rent, fees of the health authorities and fees for retailer and processor licenses.

4. Preliminary analysis

The inland fisheries sector along the Nile has a great and largely untapped potential to enhance food security and livelihoods in the country. Substantial efforts have to be made to address the main challenges that prevent the efficient development of the sector. Some of these challenges are difficult to solve, but others offer very accessible and easily implementable solutions.

Among the most important challenges are the following:

- » **Value chain:** The assessment exposed the weaknesses of the inland fisheries value chain. The cold chain is very often inaccessible, either for economic reasons or because it is not available. Infrastructure throughout the value chain, from the boats to the landing sites, processing facilities, distribution systems, market access, and other aspects, is very often weak, costly, of poor quality or non-existent. Fishing inputs are not accessible, local production is poor and international procurement is not within reach of local fisheries. Finally, there is an evident need to enhance cooperation among actors to avoid continuous food and economic losses and to attain a more equitable power structure between stakeholders.
- » **Fisheries management:** The lack of management directly affects the livelihoods and food security in the area. Fisheries management efforts are not always trusted by local fishers and so are not abided by. In other cases, lack of awareness may be the cause of ineffective or non-existent management measures. Additionally, illegal, unreported and unregulated (IUU) fishing appears to be occurring and likely contributing to the overfishing of stocks, further degrading the livelihoods of fishers.



Women processors celebrating the field team visit in Damazine, Blue Nile state

- » **Social protection:** The poor social security situation, including weak access to education, health systems and economic security, creates important and difficult challenges to improving the well-being of fishers and their families. Fishing communities with higher levels of education presented a great capacity for entrepreneurship and development of new livelihood opportunities. Health issues are an important challenge to fishing communities, in particular because fishing activities require considerable physical effort, often under meteorological conditions that negatively impact health. The lack of savings limit options for coping strategies for fisher families when they experience economic, environmental or social shocks. This is an important factor that should be addressed as a priority.
- » **Women's participation:** Women from the inland fishing communities are completely ignored in decision-making in the fisheries, despite the fact that their involvement, though less than that of the men, is crucial to the sector. The women's lower literacy and education levels and fewer or reduced managerial skills hinders their participation. The assessment clearly showed how women with higher education levels are tremendously more involved in the community activities and in household income generation. Women are involved in the fishing activities almost only when there is an evident lack of male leadership in the household. Such situations prove their capacity to be involved. The fisheries work that women carry out in their homes (due to women's mobility restrictions) are crucial, but at the same time neglected and "invisible".

5. Stakeholders' workshop outcomes

A stakeholders' workshop was organized from 7 to 8 December 2015, after the first analysis of the results of the "Assessment of Small Scale Fishers Livelihoods along the Nile River in Sudan".

The workshop was attended by 49 representatives from the Sudanese fisheries sector (fishers, women from fishing communities, local authorities, market representatives and traders) from the six states studied (Blue Nile, Sennar, White Nile, Khartoum, Nile and Northern states) and representatives from the Ministry of Animal Resources, Fisheries and Rangelands in Khartoum (Figure 43).

Figure 43. Participants of the stakeholders' workshop in Khartoum



The main results of the assessment were presented and discussed during the workshop and recommendations on the most important requirements for a sustainable inland fisheries sector in the country were decided and agreed upon by all the stakeholders.

The first day focused on the presentation of the assessment background, objectives and methodology, and the presentation and discussion of the results of the fishers, women's and markets focus groups. During the second day, the participants worked in groups to formulate recommendations, then shared their recommendations and agreed on a single set of recommendations and interventions (see agenda in Appendix 4).

The recommendations were divided into three categories:

» **Social aspects:**

- » Develop social protection measures: create or enhance social protection schemes (education, health, financial services and economic security) and initiate fishers' registration and licenses systems.

» **Environmental aspects:**

- » Environmental conservation: develop Nile fish stock evaluation, organize capacity building in data collection, implement fisheries management program and control pollution.
- » Control and combat IUU fishing and related activities: enhance cooperation among stakeholders, develop a registration system for vessels and gear, build capacity in monitoring and control among local authorities.

» **Economic aspects:**

- » Optimize value chain: analyse value chain, enhance cold chain infrastructure, establish processing facilities, organize capacity building in post-harvest management and marketing, support and enhance local production of gears and boats and organize the use of waste as feed for fish farms.
- » Develop and/or improve aquaculture.

6. Recommendations

The study generated strong, practical recommendations, based on the real challenges and context of the inland fishing communities, to better design, plan, implement, monitor and evaluate future projects in Sudan.

» Implementation of a national fisheries management program

It is necessary to develop and implement an inland fisheries management program in line with the Code of Conduct of Responsible Fisheries (CCRF) and including the application of the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries. An initial study of the state of the resource, such as a stock assessment, is necessary. This should be followed by continuous collection and analysis of data and distribution of the results to permit the constant evaluation of the stocks. In order to do this, a capacity-building program on data collection and analysis should be developed and implemented with the relevant local authorities and research institutions.

Small-scale inland fishery issues should be integrated into strategic and policy-level interventions. It is essential that all actors in the fisheries value chain be represented in decision-making entities. It is also essential to empower fishers and improve cooperation among all the stakeholders.

It is also recommended that an awareness campaign on fisheries sustainability and, importantly, on how to achieve this, be conducted. In particular, raising awareness on inland fisheries management measures, in lakes and rivers, and building greater understanding of the stocks of particular species would be useful. Furthermore, a register of fishers, vessels and gear should be implemented for future appropriate fisheries management measures.



©FAO/Paula Anton

Fisherman going back to work in Oum Shawka, Sennar state

» Strengthen fishing cooperatives/associations

Creating or enhancing fishing associations, cooperatives and organizations is indispensable and is a precious tool to reverse some of the main challenges of the sector. Association among fishers and fishing communities would create the perfect background for developing social security systems, including proper access to quality education, health systems, financial services and economic security, and for ensuring quality work environments and inclusive economies. It would also strengthen the access of the fishers to government decision-making processes, improve their participation in fisheries management and ensure their equitable access to resources. It would make them stronger market decision-makers, gaining more recognition and bargaining power to obtain lower costs. Finally, it could also ensure the permanent and equal participation of women, youth and disabled groups, an indispensable condition to ensure the efficient participation of the fishers in the sector.

In addition to fishers' cooperatives, association among the rest of the actors of the inland fisheries value chain would immensely facilitate the sustainable and efficient development of the sector in the country.

» Enhance and grow the aquaculture sector

The aquaculture sector provides a very important opportunity to diversify livelihoods and enhance food security for small-scale fishery communities, principally during low fishing seasons. Small-scale aquaculture production can contribute to rural food and nutritional security and to the generation of employment and income generation. The aquaculture sector can also take advantage of the fish losses, promoting its utilization as fish feed.

Women can participate in aquaculture activities as the work is done at the fish farm, at home, and thus is not affected by women's mobility restrictions.

» Enhance women's role

Women are a priceless human resource, often not taken into account, which can contribute widely to the enhancement of the sector. Among possible solutions to strengthen women's participation as equal and productive partners in the fisheries sector are: to ensure that policies and regulations are gender-aware, to include sex-disaggregated data in the fisheries statistics for fisheries management, to enhance the equitable responsible governance of tenure (including the use/ownership of gear, boats and services), to ensure equitable rights to the resource, and to strengthen the participatory and organizational capacity of women at various levels.

Enhancing women's participation in the small-scale inland fisheries activities will help to generate better productivity gains. This could be achieved by creating capacity – building programs for women in fishing activities and in post-harvest opportunities. The perception that women have of their own activity is key to their empowerment, as stated in the *Review of women's access to fish in small-scale fisheries* (FAO, 2015).

» Optimize the value chain

A value chain analysis is required to better program, plan, coordinate and implement projects for inland fisheries. Such improvement can be attained by optimizing the different stages of the value chain, from production to consumption and, in particular, by reinforcing the cold chain. It can also be achieved by establishing efficient infrastructure and enhancing distribution (access to landing sites, decent roads, proper and timely transport, etc.) and by improving access to appropriate fishing inputs (promoting the sustainable local production of boats, gear, etc.). Further, there is the need to strengthen local technical capacity and to reduce the loss of fish. Relationships among the various actors (fishers, traders, retailers, sellers, consumer and authorities) should be optimized, enhancing cooperation between them. The post-harvest sector of the inland fisheries value chain has possibly the greatest potential to generate sustainable jobs, diversify income generation, sustainably produce highly nutritious foods and empower and enhance the participation of women, youth and the most vulnerable members of the communities. Conducting a market study of the current

national fish consumption followed by a national awareness campaign promoting the nutritive value of the fish would also strengthen the value chain. The implementation of an official registration of retailers, sellers and traders would facilitate better management and control of the post-harvest sector. A capacity-building programme for different actors of the value chain, both men and women, on hygiene, handling, post-harvest opportunities, distribution and marketing (a fish farming school) would promote a more efficient value chain. To further enhance the sector and as a source of employment and income, the promotion of local production of gear, boats and other fishing supplies is necessary.

» **Take advantage of the opportunity offered by the production of *feseekh***

Only 20 percent of the demand of *feseekh* in Sudan is covered by local production, and export opportunities are appearing. The production of *feseekh* could be a valuable source of employment and livelihoods, and is a great opportunity for generating employment specifically for women and youth. Implementation of capacity building programs and financial services for investment would also be important. Food safety in traditional processing methods should be assessed prior to undertaking any activities in this regard.

References

- FAO. 2012. *The State of World Fisheries and Aquaculture 2012*. Rome.
- FAO. 2013. *Mainstreaming gender in fisheries and aquaculture. A stock-taking exercise. Final report*. Rome.
- FAO. 2014. *The Republic of Sudan, Fishery and Aquaculture Country Profile*. Rome.
- Lee, R. & Lentisco, A. 2015. *A review of women's access to fish in small-scale fisheries*. FAO Fisheries and Aquaculture Circular No. 1098. Rome, FAO.
- FAO. 2016. *FAO yearbook. Fishery and Aquaculture Statistics. 2014*. Rome.
- FAO. 2016. *The State of World Fisheries and Aquaculture 2016. Contributing to food security and nutrition for all*. Rome.
- Matere, A. 2007. *Management and socio-economic aspects for Jebel Aulia downstream fishery*. Khartoum, University of Khartoum (MA thesis).
- Ali, M. & Mohammed, M. 2011. Diversity of selective and non-selective fishing gear and their impact on the White Nile River. *African Journal of Environmental Science and Technology*, 5(12): 1003-1007.



Appendix 1.

Fishers questionnaire

Questionnaire for producers

Sudan fisher focus groups assessment

Date: _____ State: _____
District: _____ Village: _____

Section one: general and household information

1.1 Main employment: Fisher Fish farmer Other

1.2 Access to electricity in house: Yes No

1.3 Access to running water in house: Yes No

1.4 Home: Owned Rented Other: _____

1.5 Household composition

TYPE OF HOUSEHOLD	AVG NUMBER IN HH	NUMBER AND TYPES OF LIVELIHOODS	WHO IS CONTRIBUTING TO HH INCOME	PROTEIN CONSUMPTION	HH ASSETS (LIVESTOCK, BOAT, NET, LAND, ETC)
Poor					
Average					
Wealthy					

<< Fishermen focus groups calculating percentages of species captured using beans in Damazine, Blue Nile state

1.6 Is it common for HHs to have a family member who has emigrated out of the community?

- a) Yes No b) If yes, to where? _____
 c) For what type of work _____
 d) Why? _____

1.7 Household livelihood sources

HH INCOME SOURCES	PROPORTION OF CASH INCOME	MONTHS UNDERTAKEN											
		J	F	M	A	M	J	J	A	S	O	N	D
TOTAL	100%												
How do the income sources of a poorer family differ?													
How do the income sources of a well-off household differ?													

1.8 Household expenditures

EXPENDITURE ITEM	AMOUNT/TIME	FREQUENCY
Rent		
Electricity		
Fuel/Gas		
Water		
Food		
Education		
Health/Medical		
Transportation		
Social obligations		
Other:		
Other:		
Other:		

Section two: fisheries information

2.1 Fisheries operations

Type of Vessel: Murkab Al-Hadeed [] Murkab Al-Khasab [] Sharoaq/Bongalu []
Faluka [] Other: _____ []

Powered by: Oar [] Oar/Sail [] Outboard engine [] (if yes, Hp [])
Inboard engine [] (if yes, Hp []) Age of vessel: []

FISHING OPERATIONS				
Type of gear				
Seasons				
Frequency				
Time of day (day or night)				
Length of trip				
SPECIES				
Target species				
Non-target species				
CATCH COMPOSITION				
Average catch (kg of each species)				
Good catch (kg of each species)				
Poor catch (kg of each species)				
What are the main problems you face when it comes to fishing operations? (Keep in mind gear, habitat where you fish, the fish, etc)				
How can your fishing livelihood be improved? (increasing catch? Change in gears? Support from government? Etc)				
What kind of training do you think would be useful to assist you to improve your livelihood?				

2.2 Post-harvest

	AVERAGE CATCH	GOOD CATCH	POOR CATCH
What do you do with the catch?	Sell: []% Consume: []%	Sell: []% Consume: []%	Sell: []% Consume: []%
Are you able to sell all of your fish?			
Where/to whom do you sell your catch?	Inside community [] Outside community []	Inside community [] Outside community []	Inside community [] Outside community []
	Door-to-Door [] Restaurants [] Middleperson [] Market [] Shop [] Other: _____ []	Door-to-Door [] Restaurants [] Middleperson [] Market [] Shop [] Other: _____ []	Door-to-Door [] Restaurants [] Middleperson [] Market [] Shop [] Other: _____ []
How do you preserve your catch?	Nothing [] Ice [] Smoking [] Salting [] Drying [] Other: _____ []	Nothing [] Ice [] Smoking [] Salting [] Drying [] Other: _____ []	Nothing [] Ice [] Smoking [] Salting [] Drying [] Other: _____ []
How is the price you sell your fish determined? What are the main factors?			
Do you feel you have power in the price you receive for fish?			
What are the main constraints you think are in the way to getting a higher price for fish, what are the things you think should be improved about this?			

2.3 Fishing costs

a) fuel b) vessel repairs c) engine/parts replacement d) gear repair/replacement and type e) crew payment f) on board preservation, if any

EXPENDITURE ITEM	FREQUENCY	COST EACH TIME
Fuel		
Vessel repairs		
Engine/parts replace		
Gear repair (detail gear type)		
Gear replacement		
Daily Operations		

2.4 Changes impacting livelihoods

Environmental changes:

- » water quality
- » amount of water
- » amount of fish caught
- » catch composition
- » fishing seasons
- » extreme weather events
- » access to resources

Economic changes:

- » prices received for fish (describe)
- » input costs
- » access to inputs
- » market access
- » fishing activity
- » fisheries management actions

Social changes:

- » health issues/death
- » organization of fishing community
- » community changes
- » political issues/conflicts
- » household changes

CHANGE EXPERIENCED	PERCEIVED CAUSE OF CHANGE	HOW OFTEN DOES THIS TYPE OF CHANGE OCCUR?	COPING STRATEGY EMPLOYED/ SUPPORT RECEIVED
<p>What formal systems are in place to assist fishers deal with loss of income/livelihood? Are they aware of formal systems in place for other livelihoods?</p>			

Section three: community involvement/interactions

3.1 What community/livelihood groups are you a member of/involved in?

NAME	TYPE	SERVICES PROVIDED/ ACTIVITIES UNDERTAKEN

3.2 How do you rate how much power you have to influence decisions/actions in your cooperative/community associations?

1. No power 2. Very Weak 3. Weak 4. Moderate 5. Strong 6. Very Strong

ORGANIZATION	INFLUENCING POWER

3.3 How do your rate your cooperative/community organizations power to influence decisions/actions at the policy level?

1. No power 2. Very Weak 3. Weak 4. Moderate 5. Strong 6. Very Strong

ORGANIZATION	INFLUENCING POWER

3.4 How do these decisions benefit your livelihoods?

1. No impact 2. Very Weak 3. Weak Impact 4. Moderate 5. Strong Impact 6. Very Strong

ORGANIZATION	INFLUENCING POWER

Appendix 2.

Women questionnaire

Questionnaire for women in fishing HHs

Sudan fisher focus groups assessment

Date: _____

State: _____

District: _____

Village: _____

W1. Number of people in HH	W2. Main income activities
W3. Number of fishers in HH	
W4. What are the main activities in the HH you are responsible for?	W5. How many times do you cook per day?
W6. How many times do you cook fish per week?	W7. How much fish do you cook for your HH in one meal? (kg)
W8. What kind of fish do you cook? How do you decide?	W9. What are the meals you make with the fish?
W10. What role does food play in your culture?	

W11. What types of activities do you do outside of the HH?		W12. Are women involved in the fisheries sector?	
W13. Are you involved in any of the below activities?			
Fixing nets [] Fishing [] Processing fish [] Cleaning nets [] Other _____ [] Other _____ []			
W14. What are the main challenges fishing households face in your community?			
W15. Do you have easy access to the following services?			
	Access (Yes or No)	Easily accessible? (in terms of cost distance)	Easily accessible? (in terms of cost)
Education/schools			
Health services			
Financial services			
Other			
W16. How do households cope if there is a loss of income due to illness or death?			

Appendix 3.

Market questionnaire

Market checklist/questionnaire

Sudan SSA assessment: fisheries

Date: _____ State: _____ Name of market: _____
 District: _____ Village: _____

Market trader [] Shop owner [] Other []

M.1 Communities that you buy fish from		M.2 Communities that you sell fish to			
M.3 Who do you buy fish from?		M.4 Who do you sell fish to?			
Fishers [] Traders [] Auctions [] Other []		Households [] Traders [] Restaurants [] Other []			
M5. Do you always buy from and sell to the same people? If no, what determines who you buy from and sell to?		M6. Is your relationship with sellers and buyers only with fish, or includes other products, finances, etc?			
M.7 What preservation techniques do you use, if any?		M.8 What are the distances you usually travel with fish from initial purchase to sale?			
None [] Ice [] Refrigeration [] Drying [] Smoking [] Salting [] Other _____ []					
M.9 Fish Traded					
Species	Live/ fresh/ smoked/dried	Price you buy (currency/ quantity)	Price you sell (currency/ quantity)	Approximate amount/ month	Demand is higher or lower than supply

Appendix 4.

Stakeholder's workshop agenda

Stakeholders' workshop on the Assessment of Small Scale Fishers and Aquaculturists Livelihoods along the Nile River in Sudan

7-8 December 2015 | Grand Holiday Villa | Khartoum, Sudan

DAY 1	
09.00	Workshop opening > Opening address Sudan (Director of Fisheries, Undersecretary and State minister) > Opening address FAO (FAOR Sudan) > Introduction to the workshop
10.00	Coffee break
10.30	Background, objectives and methodology > background > objectives > methodology
12.30	Lunch
13.45	Overview of results > Fishers questionnaire results and discussion > Women questionnaire results and discussion
15.30	Coffee break
15.45	Overview of results continued > Market questionnaire results and discussion
DAY 2	
09.00	Working groups > Introduction to working groups > Working groups to formulate recommendations
10.30	Coffee break
10.45	Working groups (continued) > Working groups discussion continued > Reporting back
12.30	Lunch
13.45	Recommendations > Agreement on recommendations and interventions to be included in project
16.30	Closing of the workshop

Selling salted fish in Kosti, White Nile state >>





Livelihoods of
small-scale fishers
along the Nile River
in Sudan



Food and Agriculture Organization of the United Nations (FAO)

Regional Office for Near East and North Africa

11, Al Eslah El Zerai St., Dokki-Cairo, Egypt

www.fao.org/neareast

ISBN 978-92-5-109794-6



9 789251 097946

I7413EN/1/06.17