GCP/RAF/271/FIN-TD/71 (En)

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October 1997

TANGANYIKA FISHERIES AND LOCAL STAKEHOLDERS. An Overview of the LTR Lakewide Socio-Economic Survey, 1997

By:

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FINNISH INTERNATIONAL DEVELOPMENT AGENCY

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Bujumbura, October 1997

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PREFACE

The Research for the Management of the Fisheries on Lake Tanganyika project (LTR) became fully operational in January 1992. It is executed by the Food and Agriculture Organization of the United Nations (FAO) and funded by the Finnish International Development Agency (FINNIDA) and the Arab Gulf Program for the United Nations Development Organization (AGFUND).

LTR's objective is the determination of the biological basis for fish production on Lake Tanganyika, in order to permit the formulation of a coherent lake-wide fisheries management policy for the four riparian States (Burundi, Democratic Republic of Congo, Tanzania, and Zambia).

Particular attention is given to the reinforcement of the skills and physical facilities of the fisheries research units in all four beneficiary countries as well as to the build-up of effective co-ordination mechanisms to ensure full collaboration between the Governments concerned.

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For bibliographic purposes this documentshould be cited as follows:

Reynolds, J.E. and G. Hanek. `Tanganyika fisheries and local 1997 stakeholders. An overview of the LTR lakewide socioeconomic survey, 1997.' FAO/FINNIDA Research for the Management of the Fisheries of Lake Tanganyika. GCP/RAF/271/FIN-TD/71 (En): 79p.

GCP/RAF/271/FIN-TD/71 (En)

ACI	KNOWLEDGEMENTS	vii
1.	INTRODUCTION	1
	1.1 Survey Planning and Field Team Training	3
	1.2 Sampling Methods	4
	1.3 Survey Execution	5
	1.4 Data Compilation and Analysis	7
2.	LOCAL FISHING VILLAGES	7
	2.1 Population and Settlement	7
	2.2 Access and Transportation	7
	2.3 Basic Facilities Inventory	8
3.	RESPONDENT BACKGROUND CHARACTERISTICS	8
	3.1 Fisher Respondents	8
	3.1.1 Sample composition	8
	3.1.2 Gender, age, and formal education	9
	3.1.3 Marital status and dependants	9
	3.1.4 Place of birth and reasons for migration	9
	3.1.5 Fishing enterprise and income status	10
	3.2 Post-harvest Respondents	10
	3.2.1 Sample composition	10
	3.2.2 Gender, age, and formal education	10
	3.2.3 Marital status and dependants	11
	3.2.4 Place of birth and reasons for migration	11
	3.2.5 Fishing enterprise and income status	11
4.	RESPONDENT VIEWS ON SECTOR PROBLEMS AND PROSPECTS	12
	4.1 Personal Circumstances and Preferences	12
	4.2 State of Resources and Access Rights	14
	4.2.1 Perceived state of commercial fish stocks	14
	4.2.2 Views on general resource access rights	16
	4.2.3 Access and sustainability revisited	18
	4.3 Possible Time, Area, Effort, and	
	Technical Regulations	19
	4.3.1 Basic propositions	19
	4.3.2 Specific propositions for fishers	20
	4.3.3 Indices of agreement	21
	4.4 Role of Government and Fisheries Authorities	27
	4.5 Obstacles to Occupational Success	30
5.	TAKING OR TENDING? TANGANYIKA LOCAL STAKEHOLDERS AND CONSIDERATIONS FOR RESPONSIBLE FISHERIES MANAGEMENT	33
	5.1 Options to Regulate Fishing	34
	5.1.1 Technical measures	34
	5.1.2 Input (effort) and output (catch) controls	38
	5.2 Limiting Access	39
	5.3 Management in Partnership	41
	5.4 Concluding Observations	42

6. REE	FERI	ENCES CIT	ſED						45
ANNEX	1.	COUNTRY	OVERVIEWS	OF	1997	SEC	SURVEY	FINDINGS	50
ANNEX	2.	ADDITION	NAL STATIS	LIC	AL TAI	BLES			
		1997 LAP	KEWIDE SEC	SU	RVEY				64

ACKNOWLEDGEMENTS

The authors should like to thank all LTR staff and national team members who had a hand in the SEC survey preparations.

In particular, we are grateful to Ms. Els Bosma (LTR Kigoma) for her co-ordination of arrangements within the Tanzania sector, including organisation of questionnaire form and enumerator guide translation and duplication work, final assembly and briefing of survey teams, and field mission logistics. Her assistance with the later work of compilation and analysis of the lakewide data sets, undertaken in Bujumbura during August and September 1997, is likewise gratefully acknowledged. Mr. P. Verburg, also of the LTR station Kigoma, provided valuable help with logistical arrangements. The assistance of Messrs. D.B.R. Chitamwebwa, K.I. Katonda, A.N.M Kalangali, and S. Muhoza (TAFIRI-Kigoma) in preparing the Kiswahili translations of survey forms and the enumerator guide is greatly appreciated.

Ms. P. Paffen (LTR Mpulungu) contributed greatly to the entire exercise with her help in finalising the survey sampling scheme, formatting of the questionnaire and data entry forms, coordination of the training workshop held for the DRC and Burundi field teams in July 1997 at Bujumbura, and the later work of data compilation and analysis of the country data sets. Mr. V. Langenberg (LTR Mpulungu) helped with various aspects of survey preparation work, and provided operational backstopping for the Zambian survey team during the course of its field mission. Messrs. R. Chitembure and L. Mwape (DoF Zambia) also contributed strongly to survey preparations, and their help is acknowledged with gratitude.

At LTR Headquarters in Bujumbura, we thank Mr. Jean Marie Tumba for his general assistance, Mr. Eduard Nikomeze and Ms. Felicite Gatungane for their help in translating all survey forms and guides into French, and Mr. Mamert Mamboneza for arranging training workshop logistics.

Finally, we would like to express our deep gratitude to all village leaders and fisheries officers who assisted the national field teams in the course of their missions, and especially to all members of local sample communities -- fishers, fish processors, and fish traders -- who so freely gave of their time, information, and patience during the individual interview sessions.

TANGANYIKA FISHERIES AND LOCAL STAKEHOLDERS. An Overview of the LTR Lakewide Socio-Economic Survey, 1997

By: J.Eric Reynolds & George Hanek

1. INTRODUCTION

This document has been prepared as an overview report on the 1997 LTR socio-economic (SEC) sample survey of Lake Tanganyika sites and small-scale fishers landing and post-harvest operators. It represents the final instalment of a series of project reports detailing SEC survey planning and training activities (Reynolds 1997; Reynolds and Paffen 1997a), methods and sampling strategies (Reynolds and Paffen 1 997b), and preliminary findings for each of the national sectors -- Zambia, Tanzania, the Democratic Republic of the Congo (DRC), and Burundi (Reynolds (ed.) 1997a, 1997b, 1997c, 1997d). Whilst the present report attempts to synthesise their key elements, reference should nevertheless be made to these earlier contributions for fuller accounts of survey preparations and country-by-country results.

Although the past year has been one of particular concentration on local stakeholders and their communities, LTR scientists have from the outset appreciated that comprehensive knowledge of the socioeconomic dimension of Lake Tanganyika's fisheries is absolutely fundamental to achieving the overall project objective -- namely, a draft framework regional management plan. So, even if much of the work undertaken during the initial project phase concentrated on necessary tasks of acquiring baseline information on the lake's biological, chemical, and physical processes and their interactions, 'people questions' -- which after all are what give rise to management issues in the first place -- have always figured as an ultimate concerns.

An early indication of LTR's interest in 'people questions' is provided by the Lake Tanganyika Fisheries Directory. This was first published in 1992 and has been regularly updated as a way of facilitating contacts between fisheries agencies and user groups in the four lacustrine states (Hanek 1992, 1993, 1995). In addition, the annual Joint Meetings of the LTR Co-ordination Scientific Committees have provided International and decision-makers opportunities for fisheries from all participating countries to exchange views on policy and management questions (Hanek and Coenen 1992, 1993, 1994; Hanek and Craig 1995, 1996). A baseline document on fisheries management issues and past and present practices on Lake Tanganyika was prepared in 1994, and presented for consideration by fisheries authorities and representatives of local fishing communities in the following year (Hanek 1994; Hanek and Everett 1995). More recently, complementary studies addressing 'people questions' from legal (Cacaud 1996) and institutional (Maembe 1996) perspectives have been carried out.

Still, as project results to date were appraised in the latter half of 1996 and planning for the extension of LTR

project operations over the next few years commenced, it was obvious that further information on local resource users and their communities would be needed in preparation for work on a draft regional fisheries management plan (FAOIFINNIDA 1995; Hanek and Craig 1996).

From early 1997, therefore, and with most of the hydrobiological and fisheries research activities initiated over the first five years of the project either complete or nearing completion, the LTR team began to organise a more concerted programme of socio-economic investigations. Considerations of time and budget, the large geographical area to be covered, and the need to strengthen appreciation for socioeconomic and management-related issues amongst local fisheries researchers and administrators, were all factors that contributed to the decision to: a) base investigations on some form of sample survey; and b) plan and execute this survey work in full collaboration with personnel attached to the respective LTR national counterpart agencies and stations around the lake.

It was also recognised that one requirement for the survey would be to furnish data on broad features of fisherfolk life and enterprise in order to complement, corroborate, and/or update earlier FAO and FAO/UNDP studies within the region, including those conducted or otherwise reported under the auspices of the Fisheries Statistics and Information Project (PNUD/FAO/BDI/OO2; see Bellemans 1991a, 1991b, 1991c), the Regional Project for Inland Fisheries Planning (WIP -- RAF/87/099; see Bellemans 1991d; Hoekstra and Lupikisha 1992; Horemans 1992; Leendertse and Bellemans 1991; Leendertse and Horemans 1991; Leendertse and Mambona 1992; Maes, Leendertse and Mambona 1991; Leendertse and Gréboval 1993; Pearce 1992), and the FAO Fisheries Policy and Planning Division (Leendertse *et al.* 1994; Breuil 1995).

It was further recognised, however, that in order to serve its primary purpose of helping to prepare a sound foundation for management planning, the LTR survey needed to go beyond characterisation of local realities merely as an inventory of village features and of fisherfolk in terms of biographical data, ownership of productive assets, or type and size of income-generating activities. Attitudinal and evaluative aspects of fisherfolk realities would also have to figure as major investigative concerns. The reasoning behind this approach is very much in keeping with Christy's observations that the process of management planning must involve the fishing and general community as much as possible in order both to: a) from knowledge and perception of people directly benefit concerned in the fishery; and b) ensure fisher acceptance of the decisions that will eventually flow from the plan (Christy 1990).

Local stakeholder views of problems and prospects for the fishery had already been addressed to some extent by earlier IFIP studies, which included several 'attitudes and opinions' questions in the data collection forms used in field interviews. They have also been an important area of concern amongst those involved with village studies under the socio-economics and environmental education components of the Lake Tanganyika Biodiversity Project or LTBP (Quan 1996).¹ The LTR SEC survey work was designed to build upon and complement these earlier and ongoing studies. In particular it was hoped that the survey would provide, at a lakewide level, some useful reference points for the more geographically specific and fine-grained material accumulated through the LTBP village studies (Lwoga 1997; Petit 1997; Townsley 1997).

A framework of key issues for investigation through the lakewide SEC survey was constructed on the basis of observations and recommendations found in previous assessments of the fishery situation in Lake Tanganyika and the East African Great Lakes Region in general (e.g., Gréboval 1990, 1992; Hanek 1994; Hanek and Everett 1995; Cacaud 1996; Maembe 1996). It was also constructed with regard to management principles highlighted in the recently published FAO Code of Conduct for Responsible Fisheries (FAO 1995). The survey thus sought to pay particular attention to such questions of resource access and use rights, restrictions on gear and catch, and measures to protect stocks through seasonal and/or areal closures. Also of key importance were prospects for establishing mechanisms of co-management -an approach that involves all stakeholders, government and user groups alike, in a collaborative or joint process of setting out management objectives and defining and implementing the measures needed for their operation and enforcement (cf. IDAF 1997).

1.1 Survey Planning and Field Team Training

Much of the groundwork for the SEC survey exercise was carried out in the course of a technical consultation mission undertaken by Reynolds from mid-April to mid-May 1997, which involved an LTRsponsored planning and training workshop held at the Tanzania Fisheries Research Institute (TAFIRI) station in Kigoma. Participants formed various task groups to prepare background notes, draft data collection forms, and recommendations on survey sampling and operational procedures (Reynolds 1997; Reynolds and Paffen 1997a).

Limitations of funds, time, and personnel had to be taken into account in planning for survey structure and content (sampling proportions, scope of topical coverage in questionnaires, anticipated interview lengths, etc.). The survey team also had to work in terms of an overall deadline for the completion of the whole exercise lakewide by mid-August 1997, when the second or analysis and reporting phase of the socioeconomic consultation was due to commence.

¹LTBP is a five-year project that began in 1995 with funding from the United Nations Development Programme/Global Environment Facility. It has as its principal objective the creation of regional basin management pian involving the four lacustrine states, through which pollution can be controlled and the biodiversity of the lake sustained. The five components of the LTBP include those of Biodiversity (investigations of species, species complexes, and habitats to determine which are under threat), Pollution (identification of pollution sources, effects, and possible preventative measures), Sedimentation (monitoring of impact and evaluating possible ways of amelioration), Socio-economics, and Environmenal Education. Activities under the latter two components cover subjects including fishing and agricultural practices, appraisal of possible aquatic reserve sites and their local acceptability, and the legal issues that are or will be involved with regionally co-ordinated efforts at sustainable development and conservation of the lake's resources.

This schedule was for the most part met, despite various operational difficulties encountered by the field teams. A second training workshop was organised at LTR headquarters in Bujumbura during the first week of July 1997, which brought together members of the Burundi and DRC teams who were unable to attend the Kigoma sessions (Reynolds and Paffen 1 997a). These teams then embarked on their respective data collection missions.

The design of the three data collection forms originally proposed by the Kigoma workshop participants was revised and elaborated during the course of pilot visits to pre-test landing sites in both Tanzania and Zambia. The final draft of all three forms were prepared in English, Kiswahili, and French language versions. They include:

- Form 1: Village/Landing site inventory. (Availability of basic services/amenities; population estimates, housing conditions, etc. One form to be filled out for each sample site.)
- Form 2: Fisher interview questionnaire (Fishing unit affiliation; basic biodata; attitudes and opinions related to development/management issues -- perceptions of state of fisheries, possible regulatory mechanisms, etc.).
- Form 3: Trader/processor interview questionnaire (Type of enterprise, basic biodata; attitudes and opinions, etc.).

Each member of the respective national teams was provided with a copy of the 'Enumerator Guide,' which lays out general and step-by-step instructions for the conduct of data collection with the three forms. Additional instructions for team supervisors were also prepared (Reynolds 1997; Reynolds and Paffen 1997a, 1997b).

1.2 Sampling Methods

Sample populations of landing sites and individual respondents were constructed through a step-wise process that involved:

- geographical stratification of the shoreline within each national sector;
- further stratification of landing sites on the basis of known numbers of active fishers (1995 LTR Frame Survey data); and
- directed sampling of different categories of artisanal and traditional fishers,² processors, and traders within overall quotas set on the basis of estimated interview duration.

² 'Artisanal' and 'traditional' fisheries are distinguished on the basis of main gear operated by a fishing unit. Artisanal gear kits arc comprised either of standard lift nets, 'Apollo' lift nets, day beach seines, night beach seines, or 'chiromilla' seines, as distinct from traditional kits that consist of either handlines, longlines, gillnets, or lusenga (scoop) nets. See Challe and Kihakwe (1994) for a description of common gear types in the Lake Tanganyika fishery.

One landing site per class of landing sites was randomly chosen per area, although for some areas not all size classes were represented (see map, Fig. 1.1). Burundi and the DRC presented special circumstances due to the security situation, and in these cases it was not possible to cover the entire shoreline. For Burundi, only five landing sites were being allowed to operate by the authorities, and were thus the only ones open and available for survey. In the case of the DCR, only the three northern zones of the lake, covering areas of both Sud Kivu and Shaba provinces, were deemed to be safely accessible to the field team.

Details of sampling methods and individual fisher or postharvest respondent selection are reviewed more fully in the earlier technical paper specifically devoted to these topics (Reynolds and Paffen 1997b). Basically, the lakewide survey plan called for coverage of 80 landing sites at which some 1280 fishers and 590 processors/traders would be selected for inclusion in the respective national sample sets.

1.3 Survey Execution

As indicated by Table 1.1, the LTR SEC field teams were ultimately able to conduct a total of 923 interviews of fishers and 431 interviews of processors/traders at 66 sample sites around the lake.

Country (Region)	Form 1		F	orm 2	(Fishers)				Form 3	;
	(Village)	Α	rtisanal		Tr	aditiona	ıl	(Po	st-harv	est)
		Owner	Crew	Tot.	Owner	Crew	Tot.	Fem.	Male	Tot.
Burundi	5	28	97	125	11	19	30	8	54	62
D.R.Congo (Sud-Kivu)	5	20	34	54	7	4	11	29	24	53
D.R. Congo (Shaba)	3	11	12	23	8	2	10	17	12	29
Tanzania (Kigoma)	21	45	175	220	55	26	81	48	71	119
Tanzania (Rukwa)	18	34	97	131	26	17	43	18	40	58
Zambia	14	19	74	93	72	30	102	86	24	110
TOTALS	66	157	489	646	179	98	277	206	225	431

 Table 1.1
 Lakewide summary of sample sites visited and interviews conducted by LTR SEC survey teams

The shortfall for sites actually visited (66 versus the originally scheduled 80) by he survey teams is almost entirely due to the situation encountered in the DRC. Here the field team was only able to cover 8 of the scheduled 21 landings because of ongoing civil unrest in Shaba and Sud-Kivu provinces. The one remaining missed site of the original 80 is in Tanzania. In this case, rough weather conditions prevented the survey team aboard R/V Explorer from making a landing.

The Zambia and Tanzania SEC field teams completed their respective missions by late July 1997. For Burundi and the DRC, fieldwork was completed by early August.



Fig. 1.1 Lake Tanganyika. Map showing relative locations of 1997 SEC survey sample landing sites lakewide. Geographical strata areas are indicated by Roman numerals within each national sector. Landing site class codes appear in parentheses behind village names.

1.4 Data Compilation and Analysis

The three data collection forms were designed as much as possible with code-ready response categories. Each national survey working group was provided with a computer file of an Excel spreadsheet structured for immediate data entry of codeready items. For 'open-ended' question responses, such as in the case of fisher views on the most serious problems that confront them and their communities, coding was carried out in conjunction with the data compilation and verification work which began around mid-August 1997 at LTRBujumbura, as part of the second phase of the socio-economic technical consultation. Analysis and write-up work for the four separate country studies extended into October 1997. These studies appear in the LTR Technical Document series as TD 67 (Zambia), TD 68 (Tanzania), TD 69 (DRC), and TD 70 (Burundi).

A summary of respective national sector findings is provided in the following sections, all of which are based on the overview tables shown as Annex 1. Findings are reviewed in the topical sequence followed in the survey questionnaires. Sections 2 and 3 briefly retrace the background information gathered on survey sites and sample populations of fishers and post-harvest operators. Section 4 reviews polling results for respondents' views on sector problems and prospects in more detail, using a series of tables and graphs to provide a closer examination of this principal area of investigative concern.

2. LOCAL FISHING VILLAGES³

2.1 Population and Settlement

Sample sites range in size from a few score inhabitants at the smaller, generally more remote landings, to populations numbering in the tens of thousands at landings adjacent to major towns and regional centres. The gender structure of adult populations shows a fairly even balance within Rukwa Region (Tanzania) and DRC sites, slight to marked majorities of males within the Zambian and Burundi sites, and a majority of women at sites within Kigoma Region (Tanzania).

Nearly all sites within Zambia and Tanzania report an increase in their populations over the course of the past five years, mostly attributed to natural growth (birthrate). Political unrest in both Burundi and the DRC is identified as the major factor behind changes in population at sites in those countries, expressed either as decreases in size due to displacement of inhabitants to other places, or as increases due to influx from areas of insecurity.

2.2 Access and Transportation

Overland access to sample sites along the Zambian and Tanzanian shorelines is extremely limited, with links to outside markets restricted to water transport services in virtually all cases. For the DR. and Burundi sites, road access is generally available. Of the four national sectors, only in Burundi is there major road access along the entire length of shoreline.

2.3 Basic Facilities Inventory

The checklist of basic commercial, social, and technical services and facilities reveals a generally weak array of amenities and infrastructure in all national sectors except Burundi. Schools, medical facilities, retailing establishments, input suppliers and servicing agents, protected water supplies, electricity, telephone/radio links, post offices, banks, fisheries extension staff, and local fisher organisations are most poorly represented in Zambia, followed by Rukwa Region (Tanzania), Kigoma Region (Tanzania), and the DRC sites. Protected water supplies, electricity, telephone/radio links, post offices, and banks are absent at nearly all sites, including those in Burundi.

See Table Al .1, Annex 1, for additional details.

3. RESPONDENT BACKGROUND CHARACTERISTICS

3.1 Fisher Respondents⁴

3.1.1Sample composition

Substantial majorities of sample fishers in Tanzania (both Rukwa and Kigoma regions), DRC, and Burundi are associated with artisanal fishing units. In Zambia, the sample has a slight majority of traditional fishers. Both types of fishers depend largely on wooden planked canoes in their operations, either as a simple single hull unit in the case of most traditional fishing, or in a catamaran (doubled-up) configuration in the case of most artisanal units.⁵ Traditional units throughout the lake have an average of two members, and are thus much smaller than most artisanal units. These latter average around 11 members in the Zambian fishery, and around 6 in the other countries.

The respective country fisher sample groups can further be distinguished according to ownership of main gear operated by a unit, either artisanal or traditional, into 'owner' versus 'crew' categories. Table 3.1 shows how the resulting sub-groups break out for each of the national sectors. Because of the very small size of the sub-groups derived in this manner for the DRC and Burundi sectors, the studies prepared for these two countries (TD 69 and TD 70, respectively) treated traditional owners and crew as one combined category for analytical purposes. The common denominator of the four country studies as far as the fisher samples are concerned, therefore, is the basic 'artisanal - traditional' distinction. The present overview of survey findings is thus presented largely in terms of this dichotomy.

⁴See Table Al .2, Annex 1, for additional details.

 $^{^{5}}$ Except in Zambia, where catamarans rarely if ever are used by artisanals. The artisanal fishery in Zambia is heavily directed

towards night beach seining operations. These are usually mounted by fishing units composed of one or more 'auxiliary' boats used as light platforms, in addition to the craft which carries and sets the seine. Night beach seining units also tend to work with larger crews than those found in other sectors of the lake.

Country (Region)	Total Fishers	Artisan	al Owners	Artisar	nal Crew	Trad Ow	litional vners	Traditio	onal Crew
	(N)	n	% N*	n	% N*	n	% N*	n	% N*
Burundi**	155	28	18%	97	63%	30	19%		
D.R. Congo**	98	31	32%	46	47%	21	21%		
Tanzania (Kigoma)	301	45	15%	175	58%	55	18%	26	9%
Tanzania (Rukwa)	174	34	20%	97	56%	26	15%	17	10%
Zambia	195	19	10%	74	38%	72	37%	30	15%

 Table 3.1
 Fisher sample categories by national sector

* Approximate. ** Traditional owners and crew combined into one 'traditional fisher' category.

3.1.2 Gender, age, and formal education

Fisher respondents in all categories and countries are male. Artisanal and traditional fisher sub-group age structures appear to be broadly similar, with the bulk of respondents falling within the >18 years and <50 years range. Where owner - crew breakouts can be compared, i.e. in Kigoma and Rukwa Regions of Tanzania and in Zambia, it is clear that owners as a group tend to be older (majority> 30 years) than their crew counterparts (majority < 30 years).

Level of formal educational attainment, measured according to whether or not one holds a primary school certificate, is relatively low in Zambia and Burundi (majorities without certificates) and relatively high in Tanzania and the DRC (majorities with certificates except amongst Rukwa Region crew in Tanzania, who are equally divided between certificate holders and non-holders).

3.1.3 Marital status and dependants

Most fisher respondents of all categories across all four countries report being married and/or bearing responsibility for at least one dependant. In Zambia and the two Tanzanian regions, where the owner-crew distinction can be analysed, slightly to markedly higher rates are registered on both of these measures of social obligation by artisanal and traditional owners in comparison with their respective crew counterparts.

3.1.4 Place of birth and reasons for migration

Data on place of origin reveal a varied picture, except for the DRC, where most fisher respondents claim to be native-born residents of their current landing site bases. Traditional fishers and artisanal owners in Burundi tend to be native-born inhabitants, whereas artisanal crew tend not to be. In Zambia, only traditional owners tend to be locally born. For Tanzania, majorities of fishers in all categories across both Kigoma and Rukwa regions, with the exception of artisanal owners in the Kigoma sample, identify their places of birth as being somewhere else than their current landing site base. Within all sample groups, the most frequently cited reason for migration to current place of residence given by those born elsewhere is the desire 'to return to original family place' (place of parents' birth).

3.1.5Fishing enterprise and income status⁶

Almost all sample fishers across all categories and countries claim full-time involvement in fishing activity (takes up most working time per month). Artisanal owners lakewide tend to have longer work histories in fishing (majorities with greater than ten years' experience) than do crew (majorities with ten or less years' experience), except in the case of Burundi, where artisanal crew lead their owner counterparts in this regard. Amongst traditional fishers in Zambia and Tanzania, most crew members register ten years' or less involvement with fishing work, and most owners except those in Kigoma Region register more than ten years' experience.

Secondary employment is common throughout the groups of fisher respondents, typically in the form of subsistence or combined food crop/cash crop farming. Substantial majorities of fishers of all types claim access to at least some land except in Burundi, where most traditional fishers state that they do not own any.

Indicative information on net monthly incomes during 'good' and 'poor' fishing periods suggests that artisanal owners in Zambia and Tanzania earn substantially more than their crew counterparts. In Zambia, for instance, roughly two-thirds of artisanal owners estimate that they make the equivalent of US\$ 200 per month during 'good' periods, whereas about two-thirds of their crew report making less than this. In Tanzania, about half of artisanal owners reckon that they earn more than US\$200 per 'good' month, as against some 90% of artisanal crew who report making US\$200 or less. In both countries, traditional fishers generally report making far less than their artisanal counterparts. Furthermore, owner-crew income disparities are far less marked amongst traditionals as compared with artisanals. For Burundi, most artisanals (owner or crew) report higher 'good' period monthly incomes (US\$ 101 - 200 range) than the majority of traditionals (US\$ 51 - 100 range).

3.2 Post-harvest respondents⁷

3.2.1 Sample composition

For Zambia, (N = 100), Tanzania (Kigoma Region N = 119; Rukwa Region N = 58), and the DRC (N=82), majorities of postharvest respondents engage in a combination of fish processing and trading, as opposed to specialising in either one or the other. In Burundi (N = 62), most of the sample members are specialised in trading only.

3.2.2 Gender, age, and formal education

The gender structures of the national post-harvest samples vary quite substantially. Respondent processors/traders are mostly female in Zambia (78%) and the DRC (56%), and mostly male

⁶ Data on fishers' secondary employment, land ownership, and estimated income were not systematically collected during the DRC sector survey. ⁷ See Table Al.3, Annex 1, for additional details.

in Tanzania (60% in Kigoma Region and 70% in Rukwa Region) and Burundi (87%). Male and female sub-group age characteristics are quite similar in all cases (most respondents of either sex 40 years of age or less) except that of Rukwa Region in Tanzania, where women processors/traders are much younger as a group (most under 30 years old) than their male counterparts (most over 30 years).

Overall formal educational attainment as measured by possession of a primary school certificate is relatively low (<50% with certificate) amongst post-harvest respondents in Zambia, the DR., and Burundi, and relatively high (>50% with certificate) in Tanzania. Gender-based differences in educational attainment are very apparent in Zambia, Kigoma Region of Tanzania, and the DRC, with female respondents in all these cases reporting possession of a primary certificate at rates far below that of male respondents.

3.2.3 Marital status and dependants

The data on marital status and dependants confirm the postharvest sample groups in all four countries to be largely comprised of mature individuals with spouse and family obligations.

3.2.4 Place of birth and reasons for migration

Most processor/trader respondents originate from places other than their current landing site bases in Zambia, both regions of Tanzania, and DRC, whereas in Burundi most of those sampled report being born at or in the near vicinity of the sites where they were interviewed. For those born elsewhere, 'return to original family place' (place of one or both parents' birth), 'search for better conditions,' and 'search for opportunities in fishing or fish trading' are the most frequently cited reasons for in-migration.

3.2.5 Fishing enterprise and income status⁸

Virtually all post-harvest respondents from the four countries claim to be involved in fish processing/trading on a 'full-time' basis (activity that takes up most working time per month). With the exception of Burundi, most operators, male or have ten or less years of female, experience in processing/trading work. Gender-related differences with respect to work history are not marked, except again in the case of Burundi, where over 60% of men have greater than ten years worth of experience in processing/trading as compared to about half of their women counterparts.

Post-harvest sample operators in all countries are typically engaged in secondary employment, most frequently in the form of fishing (equipment or gear owners, occasional fishing trips, or some other interest), as in Zambia and the DRC, or in the form of farming, as in Tanzania and Burundi. Majorities of

⁸ Data on post-harvest operators' secondary employment, land ownership, and estimated income were not systematically collected during the DRC sector survey.

respondents report ownership of at least some land except in the case of the DRC.

Most processors/traders in Zambia and Tanzania estimate that they make the equivalent of US\$ 100 or less net per month during 'good' periods, and US\$ 50 or less during 'poor' periods. In Burundi, 'good' month earnings for most respondents run to US\$ 50 or less, and drop to US\$ 20 or less in 'poor' months.

RESPONDENT VIEWS ON SECTOR PROBLEMS AND PROSPECTS⁹ 4.

As this section deals with core topics of the 1997 SEC investigations, findings are reviewed in rather greater detail as compared with those pertaining to sample site features and respondent background characteristics. Also, it should be noted that a number of the survey interview items examined here clearly bear on management issues and measures which are already mediated or codified in some fashion within existing fisheries laws and regulations of the four lacustrine states. Since the main aim of the SEC investigations is to provide effective reference points for management planning, it is of overriding importance to obtain a fair reading of fisherfolk attitudes and perceptions vis-à-vis such issues and measures. Whether respondent testimony corresponds to what is 'right' or 'wrong' in a formal legal sense neither validates nor invalidates it as expression of local understandings, motivations, and an adaptations.

4.1 Personal Circumstances and Preferences

Extremely strong majorities of fisher and post-harvest respondents across all the national samples indicate a wish to continue with their present line of work (Fig. 4.la-c). By only slightly smaller majority margins, they also express a desire to continue with their work at their present bases of operations (Fig.4.2a-c).¹⁰

The picture changes somewhat when commitment to continued involvement in fisheries-related work is measured by stated preference for use of a hypothetical one year~ s savings (lump sum). On this reading, such commitment is not nearly as positive across the national sample groups. It seems strongest for Zambian traditional fisher respondents, followed by Zambian artisanals and Rukwa Region (Tanzania) traditionals (Table 4.1 a). For the post-harvest samples, a firm level of commitment is registered again in Zambia, followed in order by Kigoma Region (Tanzania) and Burundi (Table 4.1b).

 $^{^9}$ See Tables Al.4 and Al.5, Annex 1, for additional details. 10 See Annex 2 for data tables on which all figures shown in Section 4 are based.



Fig. 4.1a 'Preference to continue?' (Art. Fisher sample group)

Fig. 4.2a 'Stay present location?' (Art. Fisher sample group)



Fig. 4.1b 'Preference to continue?' (Trad. Fisher sample group)



Fig. 4.1c 'Preference to continue?' (P/harvest sample group)



Fig. 4.2c 'Stay present location?' (P/harvest sample group)



Table 4.1a First preference for use of one year's savings, sample fisher groups*

Stated Use Preference	Bur	undi	DI	RC	Tz/Ki	goma	Tz/R	ukwa	Zan	nbia
	A/Fish	T/Fish								
Fishing-related %	27.4	20.7	26.3	28.6	25.9	28.5	38.2	48.9	65.6	75.5
Processing/trading related %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All fisheries related %	27.4	20.7	26.3	28.6	25.9	28.5	38.2	48.9	65.6	75.5
Invest farming %	15.3	17.2	2.7	4.8	12.3	12.3	3.1	11.6	18.3	9.8
Invest business/shop %	19.3	13.8	26.3	28.6	15.9	18.5	13.7	11.6	9.7	11.8
Family welfare purposes %	38.0	48.3	44.7	38.1	45.0	39.5	44.2	27.9	6.4	2.9
Other %	0.0	0.0	0.0	0.0	0.9	1.2	0.8	0.0	0.0	0.0
Total %	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Report cases	124	29	76	21	220	81	131	43	93	102
Missing cases	1	1	2	0	0	0	0	0	0	0

* Most frequently cited responses indicated by boldface. Totals may not exactly equal 100.0% due to rounding.

Stated Use Preference	Burundi P/Hvst	DRC P/Hvst	Tz/Kigoma P/Hvst	Tz/Rukwa P/Hvst	Zambia P/Hvst
Fishing-related %	27.4	26.8	15.1	25.9	55.5
Processing/trading related %	25.8	3.7	40.3	5.2	20.0
All fisheries related %	53.2	30.5	55.4	31.1	75.5
Invest farming %	19.4	25.6	6.7	6.9	7.3
Invest business/shop %	9.7	12.2	5.9	5.2	9.1
Family welfare purposes %	17.7	30.5	30.3	53.4	8.2
Other %	0.0	1.2	1.7	3.4	0.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	62	82	119	58	110
Missing cases	0	0	0	0	0

Table 4.1b First preference for use of one year's savings, sample post-harvest groups*

* Most frequently cited responses indicated by boldface. Totals may not exactly equal 100.0% due to rounding.

4.2 State of Resources and Access Rights

4.2.1Perceived state of commercial fish stocks

Fishers and post-harvest operators overall tend to be very negative in their appraisals of Lake Tanganyika catch trends over recent years (taken as a variable period defined as the time since a respondent first became engaged in fishing or the fish business). Their general pessimism is readily apparent from Tables 4.2a and 4.2b, which indicate that majorities in all cases take the view that catch levels have been on the decrease.

Table 4.2a View of catches compared when first started fishing, sample fisher groups *

	Bur	undi	D	RC	Tz/Ki	igoma	Tz/R	ukwa	Zan	nbia
Change seen?	A/Fish	T/Fish	A/Fish	T/Fish	A/Fish	T/Fish	A/Fish	T/Fish	A/Fish	T/Fish
'Increase' %	37.9	34.5	7.9	5.3	3.5	2.5	14.5	4.6	2.1	1.0
'Decrease' %	53.2	62.1	85.5	84.2	78.6	88.9	67.2	79.1	91.4	88.2
'Similar' %	4.8	3.4	3.9	10.5	5.6	2.5	3.8	4.6	5.4	8.8
'No opinion' %	4.0	0.0	2.6	0.0	12.3	6.1	14.5	11.6	1.1	2.0
Total %	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Report cases	124	29	76	21	220	81	131	43	93	102
Missing cases	1	1	2	0	0	0	0	0	0	0

* Most frequently cited responses indicated by boldface. Totals may not exactly equal 100.0% due to rounding.

Table 4.2b View of catches compared when first started in fish business, sample post-harvest groups*

Change seen?	Burundi P/Hvst	DRC P/Hvst	Tz/Kigoma P/Hvst	Tz/Rukwa P/Hvst	Zambia P/Hvst
'Increase' %	25.8	0.0	5.0	19.0	0.9
'Decrease' %	66.1	87.8	88.2	69.0	95.5
'Similar' %	4.8	7.3	3.4	6.9	2.7
'No opinion' %	3.3	4.9	3.4	5.2	0.9
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	62	82	119	58	110
Missing cases	0	0	0	0	0

* Most frequently cited responses indicated by boldface. Totals may not exactly equal 100.0% due to rounding.

Zambian fishers account for their perceptions of catch declines by pointing to factors of overfishing by small-scale and industrial fleets and consequent stock diminution.¹¹ Many in Tanzania are unable to assign specific causes of catch decline, or choose not to venture any opinions. In Burundi overfishing is cited along with other factors, including environmental change and security problems (closed beaches and displaced operators). Post-harvest respondents in Zambia, Tanzania, and Burundi also blame perceived catch declines on overfishing. In the DRC a more fatalistic attitude seems to prevail, with processors/traders tending to regard declines as a matter of supernatural causes.¹²

As far as what the future holds in store, sample fishers in Zambia are quite definite as a group in their pessimism that catches will continue to be depressed (Table 4.3a). There is no solid group consensus on what to expect with catch levels in Tanzania, the DRC, or Burundi. Post-harvest respondents in Zambia share the pessimism of the their fisher compatriots in expecting further catch declines (Table 4.3b). In Tanzania and the DRC most processors and traders choose not to venture any projections for future trends. In Burundi, post-harvest women take an optimistic line.

For the Zambian fisher and post-harvest sample groups, and for the Burundi post-harvest group, where definite consensus exists on expected trends, reference can be made to the explanations respondents give for holding their views. In Zambia, further catch declines are anticipated largely because overfishing is not expected to abate. Amongst processors/traders in Burundi, the general reasoning is that an improved security situation will lead to increased catches.

Table	4.4a	View	of	catches	anticipated	for	next	five	years,
sample	fishe	er gro	ups	*					

	Bur	undi	D	RC	Tz/K	igoma	Tz/R	ukwa	Zan	nbia
Change anticipated?	A/Fish	T/Fish								
'Increase' %	46.7	42.9	31.2	26.3	13.2	14.8	14.5	7.0	4.3	1.0
'Decrease' %	27.0	28.6	15.6	26.3	40.0	38.3	43.5	60.5	73.1	72.5
'Similar' %	7.4	3.5	5.2	5.3	3.2	2.5	0.0	0.0	6.5	4.9
'No opinion' %	18.9	25.0	48.0	42.1	43.6	44.4	42.0	32.5	16.1	21.6
Total %	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Report cases	122	28	77	19	220	81	131	43	93	102
Missing cases	3	3	1	2	0	0	0	0	0	0

* Most frequently cited responses indicated by boldface. Totals may not exactly equal 100.0% due to rounding.

¹¹ See Table A2.7a, Annex 2, for fisher sample data breakdowns.

 $^{^{\}rm 12}$ See Table A2.7b, Annex 2, for post-harvest sample data breakdowns.

Change anticipated?	Burundi P/Hvst	DRC P/Hvst	Tz/Kigoma P/Hvst	Tz/Rukwa P/Hvst	Zambia P/Hvst
'Increase' %	51.6	8.5	19.3	19.0	0.0
'Decrease' %	29.0	12.2	35.3	43.1	80.0
'Similar' %	3.2	1.2	10.1	1.7	3.6
'No opinion' %	16.2	78.0	35.3	36.2	16.4
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	62	82	119	58	110
Missing cases	0	0	0	0	0

Table 4.4b View of catches anticipated for next five years, sample post-harvest groups*

* Most frequently cited responses indicated by boldface. Totals may not exactly equal 100.0% due to rounding.

4.2.2 Views on general resource access rights

Negative perceptions of past and, in some cases, projected catch trends are not consistently followed up in respondent testimony on measures that might be appropriate to ensure sustained catches in the future. Interviewees were presented with propositions on who should be allowed access to the lake's fish resources according to three levels of territorial specificity. The first and most abstract proposition called for 'everyone' to be allowed to fish 'everywhere.' The second and most specific proposition called for people to be allowed to fish outside of their own administrative districts. The third and intermediate proposition called for people to be allowed to fish outside of their own countries. Response patterns are arrayed in Figures 4.3a - 4.5c.

Burundi artisanals generally favour the 'everyone/everywhere' proposition, whereas their traditional counterparts seem to be divided on the matter. Fishers of both categories do however take a distinctly liberal attitude towards allowing people to fish across both domestic (district) and international boundaries.

DRC fishers of both categories are generally against the abstract 'everybody/everywhere' approach, and are strongly to very strongly opposed to allowing people to fish 'outside of their own country.' Traditional DRC fishers, alone of all the sample fisher groups, go so far as to oppose the idea of allowing people to fish 'outside of their own districts.' Their artisanal counterparts by a small majority go along with the idea.

In Tanzania, opinion amongst both artisanals and traditionals of both Kigoma and Rukwa regions generally favours allowing 'everybody to fish everywhere' and, more particularly, of allowing people to fish 'outside of their own districts.' On the question of allowing people to fish 'outside of their own country,' however, sentiment varies: slight to modest majority support exists amongst artisanals of both regions, and amongst Kigoma Region traditionals; Rukwa traditionals are by a large margin set against the idea.



Fig. 4.3b 'Allow everyone to fish everywhere?' (Trad. Fisher sample group)



Fig. 4.3c 'Allow everyone to fish everywhere?' (P/harvest sample group)



Fig. 4.4a 'Allow people to fish outside own district?' (Art. Fisher sample group)

Fig. 4.3a 'Allow everyone to fish everywhere?'



Fig. 4.5a 'Allow people to fish outside own country?' (Art. Fisher sample group)



Fig. 4.4b 'Allow people to fish outside own district?' (Trad. Fisher sample group)

Fig. 4.5b 'Allow people to fish outside own country?'

(Trad. Fisher sample group)

(N = 30)

Burundi

% Respondents



Fig. 4.4c 'Allow people to fish outside own district?' (P/harvest sample group)



Fig. 4.5c 'Allow people to fish outside own country?' (P/harvest sample group)





(n = 19)

DRC

(N = 81)

Tz/Kigoma

(N = 43)

Tz/Rukwa

(N = 102)

Zambia

Zambian fishers mixed give а response to the 'everybody/everywhere' proposition, but are much more definite when faced with more specific choices based on residence or nationality They do not generally favour criteria. use right limitations defined by internal district boundaries but do think that people should not be allowed to fish outside of their own countries.

Amongst the post-harvest operators, Zambian and DRC respondents are firmly against unrestricted use in the abstract, and are very much opposed as well to open access either between countries or between districts within countries. Tanzanian processors/traders adopt a liberal attitude towards use rights when put in abstract `everybody/everywhere' when qualified with terms or in-country (district) limitations, but are undecided when asked specifically about trans-country access. Their counterparts in the DRC and Burundi take a thoroughgoing positive view of open access whether cast as an abstract proposition or in more specific geographical terms.

4.2.3 Access and sustainability revisited

Figures 4.6a-c show rates national sample groups for a question that was posed immediately after the resource access questions just reviewed -- viz., 'Do you think that there will always be enough fish for everybody?'

Within the fisher samples, strong pessimism registered is by both artisanal and traditional operators in the DRC and Zambia, and a fair degree of optimism is shown by artisanals in Burundi. Opinion is rather fragmented in the case of the other national sample with groups, no strong majorities on either side of the question and frequent occurrence of 'no opinion' answers.

Within the postharvest sample groups, а somewhat similar pattern found: is Burundi processors/traders generally have optimistic expectations; consensus in DRC the and Zambia is decidedly negative; and opinion is fragmented



amongst the Tanzania sample sets.

In principle one would expect a strong association between respondents' views regarding resource access limitations, on the one hand, and their expectations regarding future resource abundance on the other. Thus, advocacy of totally unfettered access, i.e. without regard for residence or nationality (no internal or external border restrictions) are consistent with the presumption of high future resource abundance, and vice versa. In practice, however, such consistency is found only amongst artisanal fishers and postharvest operators in Burundi (majorities in favour of liberal access conditions, matched with expectations of high future abundance), and for the three Zambian respondent groups (majorities of artisanal fishers, traditional fishers, and post-harvest operators in favour of restricted access conditions, matched with expectations of low future abundance).

4.3 Possible Time, Area, Effort, and Technical Regulations

4.3.1 Basic propositions

Polling of respondent views related to residential- and countrybased use rights and expectations of future resource abundance was followed up with a further set of questions on ten possible regulatory measures. Members of both fisher and post-harvest sample groups were asked if they 'Agreed,' 'Disagreed,' or held 'No opinion' on measures that might involve: 1) seasonal closures; 2) closure of certain areas or reserves; 3) quotas on fisher numbers; 4) general mesh size restrictions (type of net not specified); 5) some form of restriction on industrial operations; 6) outright prohibition of industrial operations; 7) some form of restriction on beach seining; 8) outright prohibition of beach seining; 9) some form of restriction on lift net operations; and 10) outright prohibition of lift netting.

Overall polling results for possible time, area, effort and technical regulations are as follows.

- Majority support for measures that would limit access by season is found only amongst the fishers of Zambia and post-harvest operators in both Zambia and Rukwa Region of Tanzania (Fig. 4.7a-c).
- 2) Within the fisher sample groups, regulation of access by area (special breeding areas and/or aquatic reserves or parks) is again only favoured by artisanals and traditionals in Zambia. For the post-harvest groups, it only finds majority support with processors/traders in Rukwa Region of Tanzania (Fig. 4.8a-c).
- 3) Strong majorities in all the national fisher groups and moderate to strong majorities in all the national post-harvest groups are opposed to the idea of restrictions on the number of fishers allowed to operate, as for example through a license quota system (Fig. 4.9a-c).

- 4) On the question of general restrictions on mesh size (net types unspecified), there appears to be widespread support amongst all sample groups save those of Burundi traditional fishers (opinion divided), DRC artisanal and traditional fishers (strong rejection), and DRC processors/traders (opinion divided-- Fig. 4.10).
- 5) Moderate to strong levels of majority sentiment are registered in favour of possible measures to place restrictions (e.g. time and/or place of operation) on industrial fishing amongst fishers of both categories and post-harvest respondents in Burundi, Rukwa (Tanzania), and Zambia. Majority opinion does not support such a move amongst any of the fisher groups in the DRC or Kigoma Region (Tanzania), nor amongst the post-harvest group in the DRC. Processors/traders in Kigoma (Tanzania) are divided in their views on this question (Fig. 4.11a-c).
- 6) The idea of imposing an outright ban on industrial operations finds no majority support within any of the national sample groups. It is moderately to strongly rejected in all cases except those of the Burundi fishers and post-harvest sample members in the DRC and Rukwa Region (Tanzania), all of whom remain divided or undecided in their opinions (Fig.4.12a-c).
- 7) Measures that would place some form of restriction on beach seining only meet with majority support within the post-harvest group of Zambia (Fig. 4.13a-c).
- 8) A total prohibition on beach seining is firmly rejected by majorities across all the sample sets (Fig. 4.14a-c).
- 9) Measures that would place some form of restriction on lift net operations find majority support only in Zambia, amongst both categories of fisher as well as post-harvest respondents (Fig. 4.15a-c).
- 10)A total prohibition on lift netting is firmly rejected by majorities of respondents lakewide (Fig. 2.16a-c).

4.3.2 Specific propositions for fishers

In addition to the set of ten basic propositions put to all respondents, several further propositions were directed specifically to members of the fisher sample groups. These latter related to issues of mesh size restrictions for common types of nets, and on the banning of 'katuli,'¹³ or the 'active' gillnetting technique that involves scaring fish into a stationary net by beating, striking, or churning of the water with paddles, plungers, poles, or sticks.

When mesh size questions are posed more specifically to fisher respondents, applying in turn to gillnet, beach seine, and lift net mesh sizes, the idea of restrictions finds favour only in Zambia and amongst the two Tanzania regional groups. It is moderately to strongly rejected by both artisanals and traditionals in Burundi as well as DRC fishers (Figs. 4.17 - 4.19).

¹³ Also known as 'kulumpula' in some areas of the lake.

With reference to a proposed ban on 'katuli' fishing, strong opposition is expressed by artisanals and traditionals alike in Burundi and the DRC. Fishers in Tanzania and Zambia on the other hand are generally supportive of the idea, with the exception of artisanal operators in Kigoma Region (Tanzania), who seem to be divided in their views (Fig. 4.20a-b).

4.3.3 Indices of agreement

Table 4.4 provides another way of reading the level of sentiment amongst the various national sample sets either for or against measures intended in one way or another to reduce exploitation pressure on commercial fish stocks. For each sample group, an index score is created by summing the majority fractions either in support of (positive value) or opposed to (negative value) each of the ten basic propositions for regulatory measures. Cases of divided opinion are scored with a zero. Index scores may thus range between -10 and +10, with a zero midpoint.

Amongst the fisher sample groups, eight of the ten earn negative index scores, ranging from the moderately negative -2.54 for Rukwa Region (Tanzania) traditional fishers to the highly negative -8.44 for artisanal fishers in the DRC. Positive index scores are only seen for the two Zambian fisher sample groups, with moderate readings of +1.74 for artisanals and +1.87 for traditionals.

Within the five post-harvest sample sets, moderate positive index scores are recorded for Zambia and Rukwa Region (Tanzania) respondents, with readings of +1.03 and +0.85 respectively. Post-harvest scores for Kigoma Region of Tanzania (-2.56), Burundi (-4.99), and the DRC (-7.33) are moderately to strongly negative.





Tz/Kigoma

(N = 81)

Tz/Kigoma

Tz/Rukwa

(N = 43)

Tz/Rukwa

Zambia

(N = 102)

Zambia

DRC

Fig. 4.8b 'Closed fishing areas/places?'

(Trad. Fisher sample group)

Rummdi

(n = 29)

Burundi

100 90

80

20

10

Respondents 70

Fig. 4.7c 'Closed fishing seasons/times?' (P/harvest sample group)



Fig. 4.8c 'Closed fishing areas/places?' (P/harvest sample group)



Fig. 4.9a 'Restrict number of fishers?' (Art. Fisher sample group)

(n = 76)

DRC

(n = 120)

Burundi

Fig. 4.8a 'Closed fishing areas/places?'

(Art. Fisher sample group)

100

90

80

10

ø



(n = 219)

Tz/Kigoma

(N = 131)

Tz/Rukwa

(N = 93)

Zambia



(n = 20)

DRC



Fig. 4.9c 'Restrict number of fishers?' (P/harvest sample group)



🖾 'Agree' % 🔳 'Disagree' % 🖾 'No opinion' %





100

90

80

70

10

(N = 30)

Rorondi

% Respondents





Fig. 4.11a 'Restriction on industrial gear operations?' (Art. Fisher sample group)



Fig. 4.11b 'Restriction on industrial gear operations?' (Trad. Fisher sample group)

(n = 20)

DRC



(n = 71)

Tz/Kigoma

(n = 34)

Tz/Rukwa

(N = 102)

Zambia





Fig. 4.12a 'Prohibition on industrial gear operations?' (Art. Fisher sample group)



Fig. 4.12b 'Prohibition on industrial gear operations?' (Trad. Fisher sample group)



🗏 'Agree' % 📓 'Disagree' % 🖾 'No opinion' %

Fig. 4.12c 'Prohibition on industrial gear operations?' (P/harvest sample group)







100

90

80

70 7. Respondents

10

(n = 29)

Rurundi

Fig. 4.13c 'Restriction on beach seine operations?' (P/harvest sample group)



Fig. 4.14a 'Prohibition on beach seine operations?' (Art. Fisher sample group)

Fig. 4.13a 'Restriction on beach seine operations?'



Fig. 4.14b 'Prohibition on beach seine operations?' (Trad. Fisher sample group)

(n = 20)

DRC



(n = 80)

Tz/Kigoma

(N = 43)

Tz/Rukwa

(N = 102)

Zambia













Fig. 4.15c 'Restriction on lift net operations?' (P/harvest sample group)



🖃 'Agree' % 🔳 'Disagree' % 🔟 'No opinion' %



🖬 'Agree' % 📕 'Disagree' % 🔲 'No opinion' %



Respondent combined group majority scores on possible regulatory measures Table 4.4

RECHLATION PROPOSITION		DIGUED SAMDIE COOLD MA JODITY VIEW CODES										POST-HARVEST SAMPLE					
	ABGCENTION TROPOSITION		PUDUNDI		DDC		TTWICOM		TI VIEW SCORES		,		GROUP MAJORITY VIEW SCORES				
		BURUNDI		DRU		1 L/ KIGOMA		I Z/KUKWA		ZAMBIA							
		A/Fish	T/Fish	A/Fish	T/Fish	A/Fish	T/Fish	A/Fish	T/Fish	A/Fish	T/Fish	BUR	DRC	TZ/KG	TZ/RK	ZAMB	
Ð	Limit access by season	70	- 70	- 88	- 85	- 67	- 69	- 58	- 61	63	63	- 76	- 92	0	62	65	
2)	Provide closed areas/reserves	75	69	91	75	0	0	0	01	.80	.03	77	78	Ő	.64	.05	
3)	Impose fisher number quotas	91	90	93	85	79	85	86	81	77	75	81	95	62	57	56	
4)	Minimum mesh size restrictions	.59	0	83	80	.74	.80	.82	.94	.98	.99	.55	0	.69	.74	1.0	
5)	Restrict industrial operations	.71	.72	53	60	55	53	.52	.61	.87	.94	.52	88	0	.57	.56	
6)	Ban industrial operations	0	0	55	70	75	64	51	.54	72	73	52	0	67	0	57	
7)	Restrict beach seining	59	73	93	95	75	79	80	70	.94	.94	73	92	0	0	.80	
8)	Ban beach seining	86	90	96	95	93	90	92	84	97	92	89	98	76	60	81	
9)	Restrict lift net operations	68	80	96	90	89	86	83	79	.91	.91	69	92	64	0	.64	
10)	Ban lift nets	92	97	96	75	96	91	95	88	93	93	89	98	56	55	68	
INDEX SCORES (Range: $-10 \leftrightarrow +10$)*		-4.11	-4.97	-8.44	-8.10	-5.55	-5.37	-4.11	-2.54	+1.74	+1.87	-4.99	-7.33	-2.56	+0.85	+1.03	
*	Range midpoint = 0 (Divided Opinion	hia abaal				1:								<u> </u>			

Range midpoint = 0 (Divided Opinion/No absolute majority); minus scores indicate majority margins of disagreement; positive scores indicate majority margins of agreement.

4.4 Role of Government and Fisheries Authorities

Questions of possible effort and gear regulation naturally give rise to a further set of issues bearing on which agencies or parties should be responsible for elaborating management mechanisms, publicising them, and encouraging compliance to them. The SEC survey investigated local reaction to possible management decision-making and enforcement arrangements by posing a final set of five propositions to all fisher and post-harvest respondents. Results are portrayed in Figures 4.21 - 4.26.

Zambian and Tanzanian fishers seem to hold common attitudes on the issue of co-management. Both sample groups reject the idea that 'fishing rules should only be decided by Government,' mostly on grounds that this should be a matter of shared responsibility between the authorities and members of local communities.¹⁴ However, traditional and artisanal fisher respondents in the DRC and Burundi are very much of the opposite view, apparently because they believe that regulatory decision-making is properly an official function.

The difference in attitudes towards co-management versus `topdown' management (participatory versus non-participatory) between Zambian and Tanzanian fisheries on the one hand and DRC and Burundian fishers is not wholly reflected in the post-harvest dimension. DRC and Burundian traders and processors share with their fisher counterparts the view that regulatory matters should be a matter for authorities to decide. But whereas Zambian post-harvest respondents seem to favour a co-management approach along with their fisher counterparts, Tanzanian processors/traders remain divided in their opinions.

their views decision-making Whatever on how management responsibilities should be apportioned between the State and local communities, it appears that there is a fairly consistent pattern of consensus on propositions related to official enforcement mechanisms and sanctioning of those who violate regulations. Thus, agreement is found across all sample groups in all national sectors with regard to suggestions in favour of: a) more fisheries patrol boats to help with enforcement (Fig. 4.22a-c); b) more official fisheries scouts to help with enforcement (Fig. 2.23a-c); c) punishment in the form of fines, gear confiscation, and/or withdrawal of fishing permits for fishers who violate rules (Fig. 4.25a-c); and d) punishment in the form of fines, product confiscation, and/or withdrawal of trading permits for traders or consumers who violate rules (Fig. 4.26a-c).

In the case of the proposition that `there should be more direct police involvement to help with enforcement,' however, reaction tends to be mixed. Majority responses in favour are registered for artisanal and traditional fishers in Kigoma Region (Tanzania), artisanals in Rukwa Region (Tanzania), and for post-harvest sample groups in Burundi, both regions of Tanzania, and Zambia. Majority responses in opposition are found for artisanal and traditional fishers in the DRC and Zambia, artisanals in Burundi, traditionals of Tanzania's Rukwa Region, and post-harvest operators in Zambia. Opinion is divided within the Burundi traditional fisher and the DRC post-harvest sample groups (Fig. 2.24).

¹⁴ Refer to the respective country studies (TDs 67, 68, 69, and 70) for breakdowns of reasons cited by respondents as to why or why not Government officials should by the only ones to decide on fisheries regulations.





(n = 20)

DRC

% Respondents

10

0

(n = 29)

Burundi

4.21c 'Rules decided only by Government?' (P/harvest sample group)



Fig. 4.22a 'More patrol boats?' (Art. Fisher sample group)

Fig. 4.22b 'More patrol boats?' (Trad. Fisher sample group)

(N = 81)

Tz/Kigoma

(N = 43)

Tz/Rukwa

(N = 102)

Zambia









Fig. 4.23a 'More fisheries scouts?' (Art. Fisher sample group)

Fig. 4.23a 'More fisheries scouts?' (Trad. Fisher sample group)

Fig. 4.23c 'More fisheries scouts?' (P/harvest sample group)

Tz/Kigoma

Tz/Rukwa

Zambia

DRC

Burundi





100 90 80 70



🗏 'Agree' % 📕 'Disagree' % 🔟 'No opinion' %

100



Fig. 4.24a 'More police involvement?' (Art. Fisher sample group)
4.5 Obstacles to Occupational Success

The last item covered in the survey interviews dealt with respondents' accounts of their most serious jobrelated problems (Tables 4.5a-b and 4.67a-b). Testimony on 'most serious' and 'second most serious' obstacles to occupational success' amongst fisher sample groups reveals that there are widely shared concerns across the different national sectors with regard to problems of input supply and security.

Input supply problems relate not only to an absolute lack of gear and/or equipment supplies, but also to inadequate supplies in terms of quantity and/or quality available. Such problems are most frequently listed as a 'first most serious' obstacle by respondents within both artisanal and traditional fisher categories in Burundi and the DRC, and by traditional fishers in Kigoma Region (Tanzania) and Zambia (Table 4.5a). They are noted most frequently as a 'second most serious' obstacle by both categories of fishers in the DRC, Kigoma Region (Tanzania), Rukwa Region (Tanzania), and Zambia, and by artisanals in Burundi (Table 4.6a).

Security problems cover such matters as theft of nets, piracy, harassment by military personnel, and civil unrest and armed conflicts leading to population displacements, restricted fishing possibilities, and beach closures. They figure as 'most serious' obstacles for artisanals in Kigoma Region (Tanzania) and for artisanals as well as traditionals in Rukwa Region (Tanzania). Furthermore, at both the 'most serious' and 'second most serious' levels, security concerns often are the most frequently cited after those of input supply.

On the side of post-harvest group testimony, the problems subsumed under the general label of 'poor earnings' (attributed variously to low catches, inadequate supplies or high prices of fish, overfishing of stocks, and harvesting of juvenile stock) together qualify as the 'first most serious' obstacle to occupational success for respondents in Zambia, Kigoma Region (Tanzania), the DRC, and Burundi (Table 4.6b). Problems related to the security situation and difficulties with marketing (transport availability and/or cost, storage and/or selling facilities, product demand) appear to be the next most common areas of respondent concern (Tables 4.5b and 4.6b).

Perpense	Bure	undi		oc.				ulawa	7.5	hia
Response						.yoma m/Ria		m/Ria	∆duu)/⊡ia	
	A/FIS	I/FIS b	A/FIS b	1/FIS	A/FIS b	1/FIS	A/FIS b	1/FIS b	A/FIS b	1/F15 b
	24 7	25 0		- <u></u>	<u> </u>	11 22 2	<u> </u>	11		11 7
Lack of security %	34./	25.9	1.1	22.2	60.8	33.3	64.3	4/.0		11.7
Low catches/profit %	8.5	11.1	4.6	0.0	5.5	11.1	5.4	4.8	51.6	28.3
Seasonal fluctuations %	0.0	0.0	0.0	0.0	0.5	0.0	29.5	0.0	4.3	7.8
Lack of/inadequate gear %	46.6	51.9	84.6	77.8	30.4	53.1	0.0	45.2	35.5	44.3
Lack of engine/fuel %	1.7	0.0	0.0	0.0	0.5	0.0	0.0	0.0	1.1	0.0
Lack of/poor processing	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
facilities %										
Transport problems (to market)	0.9	0.0	0.0	0.0	0.5	0.0	0.0	0.0	1.1	1.0
8										
Problems with industrial	0.0	0.0	0.0	0.0	0.0	1.2	0.8	0.0	3.2	2.9
companies %										
Lack of /inadequate regulations	08	37	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
	0.0	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Excessive regulations %	25	74	२ 1	0 0	13	1 2	0 0	24	0 0	1 0
Exceptive fees/taxes/levies %	1 7	0 0	0 0	0.0	0 5	0 0	0.0	0 0	0.0	1 0
Lack of Coult aid %	1 7	0.0	0.0	0.0	0.5	0.0	0.0	0.0	2.0	2.0
Lack of Gov t alu &	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.4	2.0
weather conditions %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Presence of foreigners %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Safety problems/poor work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
conditions%										
Total %	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Report cases	118	30	65	18	217	81	129	42	93	102
Missing cases	7	0	13	3	3	0	2	1	0	0
+ Mast from onthe sited responses indicated by heldfore										

Table 4.5aMost serious occupational problem cited, sample fisher groups*

* Most frequently cited responses indicated by boldface. Totals may not exactly equal 100.0% due to rounding.

Table 4.5bMost serious occupational problem cited, sample post-harvest groups*

Response	Burundi P/hvst	DRC P/hvst	Tz/Kigoma P/hvst	Tz/Rukwa P/hvst	Zambia P/hvst
Lack of security %	24.6	3.7	17.9	25.0	19.1
Low catches/profit %	36.1	45.1	29.1	21.2	49.1
Seasonal fluctuations %	1.6	4.8	0.0	0.0	2.7
Lack of/inadequate gear %	3.3	1.2	5.1	11.5	0.0
Lack of engine/fuel %	0.0	0.0	0.0	1.9	0.9
Lack of/poor processing	13.1	2.4	17.9	17.3	5.5
facilities %					
Transport problems (to market)	9.8	22.0	21.4	13.5	20.9
%					
Problems with industrial	0.0	0.0	0.0	0.0	0.0
companies %					
Lack of /inadequate regulations	0.0	0.0	0.0	0.0	0.0
%					
Excessive regulations %	3.3	0.0	0.0	0.0	0.0
Excessive fees/taxes/levies %	3.3	17.1	0.9	1.9	1.8
Lack of Gov't aid %	1.6	3.7	0.0	0.0	0.0
Weather conditions %	0.0	0.0	7.7	1.9	0.0
Presence of foreigners %	0.0	0.0	0.0	0.0	0.0
Safety problems/poor work	3.3	0.0	0.0	5.8	0.0
conditions%					
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	61	82	117	52	110
Missing cases	1	0	2	6	0
* Most frequer	ntly c	ited rea	sponses	indicated	by
boldface. Totals may rounding.	y not	exactly	equal 10)0.0% due	e to

Response	Buru	ındi	DF	RC	Tz/Ki	goma	Tz/R	ukwa	Zam	bia
	A/Fis	T/Fis								
	h	h	h	h	h	h	h	h	h	h
Lack of security %	36.3	22.3	26.9	30.8	15.9	23.1	20.2	16.7	8.9	5.5
Low catches/profit %	6.2	29.7	3.8	0.0	13.1	12.3	9.2	6.7	31.6	31.9
Seasonal fluctuations %	0.0	44.4	1.9	0.0	1.1	0.0	0.0	0.0	3.8	5.5
Lack of/inadequate gear %	42.5	0.0	55.8	61.5	57.4	50.8	55.0	63.3	36.7	38.5
Lack of engine/fuel %	4.4	0.0	0.0	0.0	0.0	0.0	0.9	0.0	1.3	0.0
Lack of/poor processing	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	2.5	2.2
facilities %										
Transport problems (to market)	0.9	0.0	7.7	0.0	5.1	3.1	1.8	3.3	3.8	3.3
8										
Problems with industrial	0.0	0.0	0.0	0.0	1.7	1.5	0.0	0.0	5.1	3.3
companies %										
Lack of /inadequate regulations	0.0	3.6	0.0	0.0	0.0	1.5	0.9	0.0	2.5	0.0
8										
Excessive regulations %	8.0	0.0	1.9	0.0	4.0	6.2	6.4	0.0	1.3	1.1
Excessive fees/taxes/levies %	0.0	0.0	0.0	0.0	1.7	0.0	0.0	10.0	0.0	0.0
Lack of Gov't aid %	1.8	0.0	1.9	7.7	0.0	1.5	4.6	0.0	2.5	8.8
Weather conditions %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Presence of foreigners %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Safety problems/poor work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
conditions%										
Total %	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Report cases	113	27	52	13	176	65	109	30	79	91
No second problem mentioned	2	0	0	0	0	0	0	0	0	0
Missing cases	10	3	26	8	44	16	22	13	14	11

Table 4.6aSecond most serious occupational problem cited, sample fisher groups*

* Most frequently cited responses indicated by boldface. Totals may not exactly equal 100.0% due to rounding.

Table 4.6b Second most serious occupational problem cited, sample post-harvest groups*

	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
Response	P/hvst	P/hvst	P/hvst	P/hvst	P/hvst
Lack of security %	14.8	2.6	11.0	10.5	15.1
Low catches/profit %	16.7	7.9	26.4	28.9	49.1
Seasonal fluctuations %	0.0	22.4	0.0	0.0	0.9
Lack of/inadequate gear %	9.3	0.0	3.3	15.8	0.0
Lack of engine/fuel %	0.0	1.3	0.0	5.3	0.0
Lack of/poor processing	5.6	3.9	12.1	10.5	1.9
facilities %					
Transport problems (to market)	29.6	36.8	31.9	18.4	21.7
8					
Problems with industrial	0.0	0.0	0.0	0.0	0.0
companies %					
Lack of /inadequate regulations	0.0	0.0	0.0	0.0	0.0
8					
Excessive regulations %	0.0	0.0	0.0	0.0	0.0
Excessive fees/taxes/levies %	14.8	21.1	3.3	5.3	8.5
Lack of Gov't aid %	0.0	2.6	0.0	0.0	0.0
Weather conditions %	3.7	0.0	12.1	2.6	2.8
Presence of foreigners %	0.0	0.0	0.0	0.0	0.0
Safety problems/poor work	5.6	1.3	0.0	2.6	0.0
conditions%					
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	54	76	91	38	106
No second problem mentioned	7	6	28	14	4
Missing cases	1	0	0	6	0

* Most frequently cited responses indicated by boldface. Totals may not exactly equal 100.0% due to rounding.

5. TAKING OR TENDING? TANGANYIKA LOCAL STAKEHOLDERS AND CONSIDERATIONS FOR RESPONSIBLE FISHERIES MANAGEMENT

The national data sets generated through the three LTR 1997 SEC survey forms are very large and contain a wealth of detail that the LTR team has simply not been fully able to deal with due to constraints of time. Additional analytical treatment is certainly warranted, in order both to probe further into the selected key topics covered in this review and to extend investigation into other critical areas. In this connection, it would be a useful set of exercises to examine the fisher and post-harvest group sample data in greater depth against the background of the earlier IFIP studies conducted for Burundi (Leendertse and Bellemans, 1991), Zambia and Lupikisha, 1992), Kigoma Region of (Hoekstra Tanzania (Leendertse and Horemans, 1991), and the northern coastline of the DRC (Leendertse and Bazolana, 1992). It should be borne in mind however that the LTR survey was not intended simply to replicate the IFIP surveys. These latter dealt with fisher perceptions of sector changes and opinions on projects to varying degrees, but concentrated primarily on the task of generating descriptive details relating to boat and gear types, engines, replacement and maintenance costs, and fishing operations. Extensive data were also collected on respondent employment histories, family situations, ownership of productive assets, farming activities, and other personal circumstances. Whilst similar information was gathered in varying degrees of detail through the LTR survey interview forms for fishers (Form 2) processors/traders (Form 3 -- see Reynolds and Paffen, 1997b), and the basic intention was to use personal history and occupational data along with information collected on local community features (Form 1) to set out a general context within which respondents' opinions and

views on sector problems and prospects -- with all their implications for fisheries management planning -- could be appreciated.

With a view towards the ultimate LTR project objective of formulating a draft framework fisheries management plan for the lake, it is to these management implications that the concluding observations of this overview are addressed. Salient points for consideration can be set out according to the approach suggested in the 'Fisheries Management' module of the FAO Technical Guidelines for Responsible Fisheries (FAO, 1997). As stated in the module section on 'management measures and approaches' (Section 3),

...the only mechanism available to maintain the biomass and productivity of a resource at a desirable level, at least in wild capture fisheries, is controlling fishing mortality by regulating the amount of fish caught, when they are caught and the size and age at which they are caught. In regulating fishing mortality there are a number of approaches which can be used, and each one will have different implications and different efficiencies for regulating fishing mortality, impact on fishers, feasibility of monitoring, control and surveillance and other facets of fisheries management [45].

The module section then proceeds to review possible management measures along with critical issues of equity and accommodation of user interests under the headings of 'options to regulate fishing,' 'limiting access,' and 'management in partnership.' In what follows, and under the same headings in the same order, an attempt is made to relate the main themes reviewed in the *Technical Guidelines* to the Lake Tanganyika situation as portrayed through the SEC survey findings.

5.1 Options to Regulate Fishing

5.1.1 Technical measures

Gear restrictions

Modalities of gear restriction noted in the *Guidelines* include those pertaining to: a) type of gear (e.g. gillnet); b) gear characteristics (e.g. net mesh size); and c) operation of gear (e.g. 'active' gillnetting).

Lake Tanganyika fishers and post-harvest operators were polled on several possible gear restriction measures during the 1997 SEC survey. 'Type' questions include those pertaining to some measure of control or outright prohibition on the use of three common fishing gear on the lake -- viz., the purse seines set by 'industrial' units and the beach seines and lift nets that are the usual tools of the artisanal fishery. 'Gear characteristic' questions include those on general mesh size restriction, which were addressed to all respondents, and those concerning particular types of nets, which were addressed specifically to fishers. 'Gear operation' concerns were limited to the method known locally as 'katuli,' the commonly encountered method of frightening fish into a stationary gillnet. Local stakeholder reactions to the gear restriction propositions are arrayed in Tables 5.1 below.

- 1) RESTRICTIONS ON TYPE
 - a) Controls on industrial gear
 - Majority support exists for some measure of restriction of industrial gear within artisanal and traditional sample groups in Burundi, Rukwa Region (Tanzania), and Zambia. Majority opinion against such restriction is registered amongst artisanals and traditionals in the DRC and Kigoma Region (Tanzania).
 - Amongst post-harvest operators, majority opinion supports some measure of control on industrial gear in Burundi, Rukwa Region (Tanzania), and Zambia; majority opinion in the DRC is against any controls and opinion in Kigoma Region (Tanzania) is undecided.
 - b) Prohibition of industrial gear
 - A total ban on industrial fishing is not supported by majority opinion in any of the national fisher sample sets except that of Rukwa Region traditionals. Fishers in Burundi remain undecided on the issue.
 - Within the post-harvest sample sets, majorities in Burundi, Kigoma Region (Tanzania), and Zambia are against any industrial fishing ban; majority opinion in the DRC and Rukwa Region (Tanzania) is undecided.

Table 5.1 (Cont.)

- c) Controls on beach seining
 - This proposed restriction finds majority favour only amongst Zambian fishers (artisanal and traditional).
 - For the post-harvest sample groups, opinion is largely favourable in Zambia, undecided in Kigoma and Rukwa regions of Tanzania, and opposed in Burundi and the DRC.
- d) Prohibition of beach seining
 - A total ban is rejected by heavy majorities across all fisher and post-harvest sample groups.
- e) Controls on lift nets
 - Some form of control on lift netting is firmly rejected by majorities in all cases except those of Zambia, where general support is registered amongst both of the fisher groups as well as post-harvest operators.
- f) Prohibition of lift nets
 - A total ban is rejected by moderate to substantial majorities across all fisher and post-harvest sample groups.

²⁾ RESTRICTIONS ON CHARACTERISTICS

a) General restrictions on mesh sizes

- Fairly widespread support exists for general restrictions on mesh size (net types not specified). Strong fisher group majorities in favour are found in both regions of Tanzania and in Zambia. Burundi artisanals are basically supportive, but Burundi traditionals are divided in their views. Both categories of DRC fishers are firmly opposed to the principle of minimum mesh size restrictions.
- Moderate to substantial majorities in the post-harvest sample sets are supportive of minimum mesh sizes, except in the DRC where opinion is divided.
- b) Minimum gill net mesh size
 - Opinion within both the artisanal and traditional fisher sample groups in Kigoma and Rukwa regions (Tanzania) and in Zambia substantially favours gillnet mesh restrictions. Opinion within the fisher samples of Burundi and the DRC runs against such measures.
- c) Minimum beach seine mesh size
 - Minimum size restrictions for beach seines find solid support amongst both categories of fishers in Kigoma and Rukwa regions (Tanzania) and in Zambia. They are opposed by slight to solid majorities of fishers in Burundi and the DRC.
- d) Minimum lift net mesh size
 - Lift net mesh restrictions are favoured by solid majorities of fishers in both regions of Tanzania and in Zambia. They are rejected by solid majorities in Burundi and the DRC.

3) RESTRICTIONS ON OPERATIONS

- a) Prohibition of katuli fishing
- The proposition that this form of 'active' gillnetting be banned outright is generally supported by fishers in Tanzania and Zambia, but meets strong opposition by those in Burundi and the DRC.

Table 5.1 (Cont.)

4) RESTRICTIONS AND OCCUPATIONAL PROBLEMS

- Although opinion varies from one proposition to another, with some sample groups definitely weighing in favour of certain measures, the general reading is one of reluctance to accept dramatic restrictions on gear. Reference to respondents' statements on the 'most serious problems' they face in their work suggests some underlying reasons for such reluctance.
- Fisher respondents across all the national sample sets tend to rank input supply problems either as `most serious' or `second most serious' occupational obstacles. Not only is gear and/or equipment often

difficult to come by at all, but there are also problems of adequate quantity and/or quality when supplies are available.

• Processors and traders identify 'low earnings' as a foremost concern -- a set of problems that could be brought on in part at least by poorly equipped fishing units.

Area and time restrictions

Area and time restrictions define open and closed 'windows' for the application of fishing effort, as for example with 'no fishing zones' in known breeding and nursery grounds during particular months, or with aquatic reserves for the conservation of critical habitat and biomass. Whilst it is theoretically possible to use seasonal and spatial restrictions '...to regulate total fishing mortality on a resource' (FAO 1997: 47), their implementation may be extremely problematic. To be effective, they must not only be established with reference to appropriate biological considerations, and with due concern for effort concentration or transfer effects (too much effort during 'open window' conditions or excessive effort displacement to other areas); they must also be accepted and respected by user groups.

The 1997 SEC survey provides the following readings on local views of time-space restrictions for Lake Tanganyika.

Table 5.2 Survey indicators -- area and time restrictions

- 1) CLOSED SEASONS/TIMES
 - Amongst fisher sample groups, only those in Zambia give majority approval to the idea of instituting fishing closures during certain seasons or times in order to allow fish to breed and/or grow. The proposition is rejected by rather emphatic majorities in all other cases.
 - Post-harvest operators give majority approval for possible seasonal closures in Rukwa Region (Tanzania) and in Zambia. Opinion is divided in Kigoma Region (Tanzania), but solidly opposed in Burundi and the DRC.
- 2) CLOSED AREAS/PLACES
 - Area or place closures such as for river mouths or sandy bays in order to protect breeding and growing habitats find strong majority support amongst artisanals and traditionals in Zambia. They are opposed by strong majorities of both categories of fishers in Burundi and the DRC. Fisher opinion in the two regions of Tanzania is very fragmented over this question.
 - Rukwa Region (Tanzania) processors/traders lend fairly solid support to the principle of area restriction. Post-harvest sample group views in Zambia and Kigoma Region (Tanzania) are divided. In both Burundi and the

5.1.2 Input (effort) and output (catch) controls

Input control can be used to regulate fishing mortality through the imposition of limits on fishing capacity and effort. Typical mechanisms include licensing ceilings, individual effort quotas on fishing units, and the use of technical specifications to limit the harvesting power of vessels and/or their gear kits.

Output control is a commonly encountered management measure that theoretically `...allows estimation and implementation of the optimal catch to be taken from a stock by a given harvesting strategy' (FAO 1997: 50). It typically entails `...setting a total allowable catch (TAC) which is then sub-divided into individual quotas by fishing nation (in the case of international fisheries), fleet, fishing company, or fishermen (e.g. in the case of individual quotas)' (*ibid*).

Although the LTR survey did not probe for respondents' views on input and output controls through specific questions covering all possible mechanisms, indications of local opinion or predisposition can be read from responses to questions relating to preference for continued involvement in fisheries-related work, perceptions of recent catch trends and expectations for the immediate future, the idea of placing quotas on the total number of fishers allowed to operate on the lake, and the possible imposition of restrictions of one kind or another for certain fisheries.

Table 5.3 Survey indicators -- input and output controls

- 1) PROJECTIONS FOR CONTINUED INVOLVEMENT IN FISHERIES SECTOR
 - Direct questions to fisher and post-harvest respondents on future occupational and residential preferences reveal that solid majorities in all the national sample sets would like to stay with their present line of work and remain at their present bases of operation.
 - Commitment to continued work in the sector is not so definite amongst the sample groups when gauged according to respondents' stated investment preferences. Zambian fishers and post-harvest respondents remain with strong readings on this measure along with, though to a lesser extent, post-harvest interviewees in Kigoma Region (Tanzania) and Burundi.
- 2) FISHERFOLK VIEWS OF CATCH TRENDS
 - Fisher and processor/trader sample groups alike are decidedly negative in their appraisals of recent catch trends in the lake. There is no solid body of opinion as to the reasons for decline except amongst Zambian fishers and post-harvest operators, most of whom seem convinced that over-fishing is a principal cause. A slight majority of Burundi post-harvest respondents also blame over-fishing pressure, whereas opinion amongst the remaining national sample groups is fragmented or

undecided.

- Expectations for catch trends in the short-term future are mixed. Traditional fishers in Rukwa Region (Tanzania) and both artisanals and traditionals in Zambia are collectively pessimistic, as are post-harvest respondents in Zambia. No group consensus on expected trends is registered for any of the other national sample sets.
- 3) FISHER QUOTAS
 - Substantial majorities within all the fisher sample groups voice opposition to the idea of imposing restrictions on the overall number of fishers allowed to operate on the lake.
 - Collective opinion in the processor/trader sample sets is also set against the idea of fisher quotas, though majority margins amongst Tanzanian and Zambian respondents are considerably less than those found for the Burundi and DRC post-harvest groups or any of the fisher sample groups.

Table 5.3 (Cont.)

- 4) CONTROLS FOR SPECIFIC FISHERIES
 - As already indicated, respondents across the national fisher and post-harvest sample sets generally do not lend their support to controls on the beach seine or lift net fisheries. Broad support does seem to exist for controls on the industrial fishery. Since no specific forms of restriction were at issue (catch controls and/or gear specification and/or time-space limitations, etc.), the question is more one of principle than particulars.

5.2 Limiting Access

As remarked in the *Technical Guidelines*, use right regimes in free-range resource exploitation systems such as fisheries can broadly be divided into open access and limited access systems. Open access is basically a 'free-for-all' or 'first come, first served' condition which, if left totally unregulated. '...will invariably lead to over-exploited resources and declining returns for all participants' (FAO 1997: 52). Even in situations where controls on exploitation levels are put in place, such as TACs or seasonal closures, '...open access systems are characterized by a race to fish in which all participants strive to catch as much of the resource ... as they can, before their competitors do so' (*ibid*).

It is generally recognised that, for a fishery to be sustained, the 'free-for-all' situation must give way to one of access limitation in some form. In most instances where fisheries resources fall within national jurisdictions, this involves the granting of conditional use rights by the State or its management authority such that the State, whilst retaining ownership of the resources, allows their exploitation by designated communities, user groups, firms, or individuals.

The survey dealt directly with the issue of access and its possible limitation by posing three propositions for use rights cast at different levels of abstraction, and indirectly through a question on respondents' views of resource abundance.

Table 5.4 Survey indicators -- access limitations

- 1) OPEN ACCESS
 - Fisher responses to the most abstract open access proposition ('everyone/everywhere') are mixed. Majority support for the idea is found amongst both categories of fishers in both regions of Tanzania and amongst artisanals in Burundi. There is a consensus against totally unrestricted access in the DRC. Opinion in Zambia and amongst Burundi traditionals is divided.
 - Post-harvest respondent opinion likewise is not consistent across the national sample sets. Open access is moderately to strongly endorsed by groups in Burundi and the two regions of Tanzania; it is firmly opposed by the Zambian sample group and even more by the DRC group.
- 2) NATIONAL ACCESS
 - Fishers of both categories in all the national sample groups except the DRC would favour allowing people to fish 'outside of their own district' (i.e. across internal administrative boundaries within their respective countries). DRC artisanals by a moderate majority are also in favour of this range of access rights; their traditional counterparts are by moderate majority opposed.
 - For the post-harvest groups, considerable majorities in Burundi and both regions of Tanzania support 'outside of own district' access rights. Strong group opposition is found in the DRC and Zambia.

Table 5.4 (Cont.)

3)	INTERNATIONAL	ACCESS
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- On the question of allowing people to fish in waters 'outside of their own country,' strong positive response is found only amongst fishers in Burundi. Moderate to strong opposition is encountered in the DRC and Zambian fisher samples and amongst Rukwa Region (Tanzania) traditionals. Slight to modest majorities of artisanals and traditionals in Kigoma Region (Tanzania) and artisanals in Rukwa (Tanzania) support the proposition.
- Consensus in the processor/trader sample sets is strongly in favour of access across country borders in the case of Burundi, and strongly opposed in the cases of the DRC and Zambia. Opinion in Tanzania runs slightly

in favour for the Kigoma Region group, and slightly against for the Rukwa Region group.

- 4) ACCESS AND EXPECTATIONS OF RESOURCE ABUNDANCE
 - Both artisanal and traditional fishers in the DRC and Zambian sample sets tend to think that fish resources in the lake will not 'always be enough for everybody.' On the other hand, opinion amongst artisanals in Burundi is mildly optimistic. Respondents in the other sample sets are divided or undecided in their views.
 - Burundi processors/traders take a generally optimistic line on future resource abundance. Opinion in the DRC and Zambia tends strongly towards the negative. In Kigoma and Rukwa regions of Tanzania it is divided or undecided.

5.3 Management in Partnership

Co-management, or what the *Technical Guidelines* refer to as 'management in partnership,' is a central tenet of responsible fisheries. Fisheries typically involve a complex of interests which share differing or even contradictory aims. Responsible management endeavours to accommodate such interests and recognises that '...the efficiency and implementability of the management measures are often highly dependent on the support gained from the interested parties' (FAO 1997:55).

The Guidelines go on to note that:

Management in partnership encompasses the various arrangements which formally recognize the sharing of fisheries management responsibility and accountability between a fisheries management authority and institutions either public, such as local level government, or private, such as a group of interested parties. Hence, ...[it] is likely to ...[have] a decentralized and unstandardized nature. It often reflects a concern for efficiency or equity at the State or management level, coupled with proven capacity for self-governance, self-regulation and active participation at the level of the interested parties concerned [*ibid*].

Depending on circumstances, co-management arrangements may feature higher or lower degrees of intervention and support by the State -higher where local-level commitment and capabilities are weak, lower where they are strong.

Local attitudes towards possible co-management arrangements were probed during survey interviews through a final set of propositions dealing with the general issue of shared decision-making responsibility and official enforcement and sanctioning mechanisms.

Table 5.5 Survey indicators -- management in partnership

- 1) ATTITUDES TOWARDS CO-MANAGEMENT
 - Fishers in Zambia and the two regions of Tanzania tend to reject the proposition that 'fishing rules should only be decided by Government.' DRC and Burundi fishers, on the other hand, give it very solid support.
 - For the post-harvest sample sets the proposition is rejected by a majority of respondents only in Zambia. It is supported by strong majorities in the DRC and Burundi. Respondents in both regions of Tanzania remain divided in their views.
- 2) VIEWS ON OFFICIAL ENFORCEMENT MECHANISMS
 - Fishers of both categories across all the national sample groups lend majority support to suggestions that there should be more fisheries patrol boats and more fisheries scouts to help with regulation enforcement.
 - The idea that there should be more direct involvement of the police in fisheries enforcement finds majority favour only in Tanzania, amongst both artisanals and traditionals in Kigoma Region and artisanals in Rukwa Region.
 - All the post-harvest groups give firm majority support to the suggestion for more fisheries patrol boats. There is also strong support for the idea of deploying more fisheries scouts except amongst the DRC respondents, who remain divided on the question.
 - Slight to moderate majority support for more police involvement in fisheries enforcement is found within the post-harvest sample groups in Burundi and both regions of Tanzania. It meets majority opposition amongst Zambian processors/traders. Opinion is divided or undecided in the case of DRC post-harvest respondents.
- 3) VIEWS ON SANCTIONS
 - Extremely strong majority sentiment is measured across all the national sample sets in support of suggestions, very generally stated, that violators of fisheries regulations should receive some punishment -- either in the form of fines, gear confiscation, and/or withdrawal of fishing permit in the case of fishers, or in the form of fines, product confiscation, and/or withdrawal of trading permit in the case of traders or consumers.

5.4 Concluding Observations

Survey findings on fisher and post-harvest respondents' views on sector problems and prospects help set the stage for the next phase of LTR project work -- the preparation of a draft framework management plan for Lake Tanganyika fisheries. Again it is noted that the survey investigations are primarily concerned with local people's attitudes and perceptions related to management issues and measures, as distinct from the way such issues or measures may be reflected within existing fisheries legislation of the four lacustrine states. Various statutory instruments in various of the states now formally govern, for example, conditions of access to the fishery, harvest methods, net mesh specifications, and restricted fishing zones (Cacaud 1996). Polling of respondents on propositions pertaining to these and similar regulatory modalities shows that in many cases local opinion seems to diverge from or even be at odds with 'what the law says.' But the object of the exercise is not to determine 'correct' or 'incorrect' thinking from a legal standpoint, or to prejudge it in any other way, for that matter. The object is rather to gain some appreciation of which considerations, factors, or circumstances inform the decisions and behaviours of the legions of small-scale fisherfolk who rely on Lake Tanganyika's resources for their livelihoods.

The value of such information for a management planning exercise is that it fixes crucial reference points for the review of existing arrangements and their effectiveness as tools to promote responsible resource conservation and use. In the context of the small-scale fisheries of Lake Tanganyika, planners and fisheries authorities can thus consider a range of options for improvements in the regulation of fishing, limitation of access, and allocation of management duties, with the benefit of some background knowledge on which measures are likely to command widespread community support and which will require special efforts to foster public acceptance through local-level consultation and environmental education.

Specifically with regard to fisheries legislation within the four lacustrine states, which is in many respects outdated, poorly enforced, and widely ignored by local fisherfolk (Cacaud 1996), the LTR survey findings may serve as pilot markers to help guide initiatives in community outreach, so that new or revised regulations may be drafted and eventually implemented with strong public participation.

Generally with regard to the overall task of revamping management approaches to suit the circumstances of an internationally shared fisheries complex, the survey findings suggest that local stakeholder populations broadly accept, at least in principle, that exploitation of their common resource base should be subject to some sort of governing framework. This is implicit in the widespread concern expressed for the state of commercial stocks and the high approval ratings on propositions to enhance official enforcement capabilities.

On the other hand, there is mostly a lack of consensus one way or the other on specific measures that could possibly be useful for controlling fishing mortality. Exceptions occur as negative reactions to questions of gear type restriction and operator quotas: moderate to heavy majorities across all the national sample groups surveyed reject the idea of imposing a prohibition on beach seining or on lift net fishing; they also reject the suggestion that an overall limit be placed on the number of fishers allowed to operate on the lake.

Other than these few cases, it is apparent from the survey that

opinion is divided, and sometimes heavily so, on a wide array of questions. Thus, differences of view are registered in response to suggestions that: a) some form of controls be placed on industrial gear, on beach seining, or on lift net operations; b) a total ban be imposed on the use of industrial gear; c) minimum mesh size specifications be applied generally, or specifically for gill nets, beach seines, or lift nets; d) the method of frightening fish into a stationary gillnet, known as 'katuli,' be completely prohibited; e) area and time restrictions be established, as for example to protect breeding or juvenile fish communities; f) access to the fishery be conditioned by certain criteria of residence or nationality; and g) government authorities retain exclusive responsibility for deciding on fishing rules.

In fine, the 1997 LTR SEC survey results indicate that, although prospects for agreement on some fundamental elements of a common management strategy appear good, the task of formulating a regional framework plan for the fisheries of Lake Tanganyika faces some considerable challenges. There are notable variations, both **between** and **within** the respective national populations of fishers and postharvest operators, in the way local actors regard the lake and the promises and problems that it offers. Much rests on the extent to which locals are willing to identify with the need for 'tending' the resource base as opposed only to 'taking' from it, and on the extent to which they are willing to assume management decision-making and enforcement responsibilities.

Of particular concern is the rather dramatic difference of orientation between those who seem to favour 'participatory' or 'partnership' approaches to management and those who advocate that 'fishing rules should only be decided by Government' -- the 'topdown' arrangement that features a high degree of state intervention reinforces an 'us' versus 'them' and often response of disassociation amongst local resource users. Because it offers such obvious advantages in terms of long-term effectiveness, Lake Tanganyika regional framework planners will want to encourage the 'participatory' management option as much as possible. Yet the basic split between this and the 'top-down' orientation towards management responsibilities will have to be taken into careful account, as something a framework plan should seek to mediate through a step-by-step process rather than to 'fix' with rigid prescriptions. The point is perhaps best expressed by a passage in the Technical Guidelines (FAO 1997), which is cited here in closing:

endeavour, establishing and implementing complex As а partnership arrangements should, as for other management processes, follow a structured approach involving research, consultation, decision-making and institutional reform. Approaches should be flexible to fit specific situations, countries, fisheries and fishing communities. They should also for gradual implementation, possibly driven allow by the accumulation of formal knowledge by the responsible interest groups on the relevant social, economic and environmental issues [57].

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ANNEX 1

COUNTRY OVERVIEWS OD 1997 SEC SURVEY FINDINGS

Table A1.1 Lakewide summary of LTR SEC Survey findings: local fishing villages.

Survey Enumeration Items

1) P	ZAMBIA	TANZANIA	DEM. REPUBLIC OF CONGO	BURUNDI
1) 1	Site populations range from few score inhabitants to over 1400. Male majority in adult population at most sites. Increase in overall population reported over the past five years nearly all cases, mainly due natural growth.	Considerable size range, from a low of around 40 inhabitants to a high of over 9,800. Gender structure of village adult populations indicates slight to marked majority of women at most Kigoma Region sites, whereas for Rukwa Region the situation seems more evenly balanced between sites with female majorities and those with male majorities. Nearly all sites report an increase in overall population compared with the situation five years ago. Growth is attributed primarily to 'natural increase.'	Village sizes range from a few hundred to few thousand inhabitants, except for the largest site, Kasenga (in Sud-Kivu), with a reported population of some 6700. Adult population gender structure fairly evenly balanced, with slight to moderate majorities in favour of women in six out of the eight sample sites. Political unrest reported to have caused a decline in population over the past five years in four villages.	Estimated total populations for the five sites surveyed range from a low of several hundred inhabitants to scores of thousands. Gender composition of adult populations is skewed, with a moderate to marked majority of males. Three sites report increase in overall population size compared with situation 5 years ago. Growth due primarily to 'influx of people displaced from other places.' Two sites with reported decrease in population size also attribute change to 'security problems.'
2) A	ccess and transportation			
3) R	Road access to sample sites extremely limited. In few places where connections exist, road surface conditions are poor and overland passenger and market transport services non-existent. Access to outside markets in virtually all cases restricted to water transport links.	Road access to sample sites practically nil. In few cases where connections do exist, conditions are poor and overland passenger and market transport services non-existent. Access to outside markets is largely restricted to water transport.	Most villages have overland access to major regional towns, and all but one are served by regular water transport connections.	All landing sites served with road access (main highway along the entire Burundian shoreline from the DRC border through Bujumbura and south to Nyanza Lac). No regular water transport because of ease of overland connections.
<i></i>	Scarcity of basic commercial, social, and fisheries technical facilities/services. Schools, medical facilities, retailing establishments, and fishing gear/ equipment supply/service agents relatively few and far between. Amenities including protected water supplies, electricity, telephone/radio call service, post offices, and banks lacking entirely. No Fisheries Department extension staff or any active local fisher committees/ organisations recorded at any of the sites.	There is a dearth of essential commercial, social, and fisheries technical facilities/ services in Rukwa Region. Kigoma Region sites are comparatively better served, but neither region is very well endowed with major amenities including protected water supplies, electricity, telephone/radio call service, post offices, and banks. Active local fisher committees are recorded for about a third of the Kigoma sites, but hardly show up at all in the Rukwa inventories.	Sud-Kivu sites fairly well served with basic retailing services, but not with fuel and gear/equipment supply/service agents. In Shaba, Athenée, close to regional centre of Kalemie, is catered for by numerous retail and service agents. Two other Shaba sites have very poor basic service inventories. For both provinces, primary schools at 6 of 8 sites, medical facilities at 3 sites, electricity at 2 sites, and protected water supplies at 2 sites. No telephone/radio call service, post offices, or banks at any location. No Fisheries Department extension staff but all sites report active local fisher committees.	Relatively high level of infrastructural development in comparison to other sectors of the lake. Most villages monitored have basic medical facilities, primary and secondary schools, retailing establishments, and fishing gear/equipment supply/service agents. However, amenities including protected water supplies, electricity, telephone/radio call service, post offices, and banks lacking at all sites except for in Rumonge. All sites served by Fisheries Department extension staff. Local fisher committees recorded at Kadjaga/Gatumba, Karonda and Rumonge.

Lakewide summary of LTR SEC Survey findings: local fishers -- background characteristics. Table A1.2

Survey Enumeration Items

ZAMBIA

TANZANIA

DEM. REPUBLIC OF CONGO

BURUNDI

1) Fisher sample composition

A slight majority (52%) of the Zambian A substantial majority of the 475 fisher Fisher sample composed of 99 individuals The Burundian survey team worked with a fisher respondents are associated with respondents interviewed by the Tanzanian in total, of whom 78% represent artisanal total of 155 individuals, a large majority traditional fishing units, which usually survey team in both regions (73% for units (32 artisanal owners and 45 crew), (80%) of whom are associated with operate with planked canoes and have an Kigoma and 75% for Rukwa) are associated and 22% traditional units (21 individuals, artisanal gear kits (28 owners, 97 crew). average crew size of two. Artisanal units with artisanal gear kits. Fishing units of combined owner-crew categories). also depend primarily on planked canoe as both the artisanal and traditional variety main gear carriers, light boats, and other typically operate either with planked Traditional units typically operate with sample. auxiliary craft to assist in fishing canoe or catamaran (doubled-up planked planked canoes, and artisanal units with operations. With an average of 11 canoes) fishing boats. Dugout canoes are catamarans (doubled up planked canoes). Artisanal units mostly work with individuals per unit, they are much larger much less common. Minor numbers of Average team size for artisanal units is 6 catamaran fishing boats. Relatively few than traditional fishing teams.

ownership role, the Zambian fisher sample size is 6 fishers within both regions. For population of 195 comprises 19 owners of traditional units, the average size is 2 for artisanal main gear, 74 artisanal crew Kigoma Region and 3 for Rukwa. members. 72 owners of traditional gear, and 30 traditional crew members.

additional 'auxiliary' craft (almost always members, and for traditional units 2 single planked canoes encountered planked canoes) are used to assist with members. Distinguished according to main gear fishing operations. Average artisanal unit

Based on the criterion of main gear ownership, the Tanzanian fisher sample population for Kigoma Region can be broken down into 45 artisanal owners, 175 artisanal crew, 55 traditional owners, and 30 traditional crew. For Rukwa, there are 34 owners and 97 crew representing the artisanal fishery, and 26 owners and 17 crew representing the traditional fishery.

There are 30 traditional fishers (combined owner- crew categories) represented in the

amongst sample fishers. Average team size of artisanal units is 6 members, and for traditional units 2.

Table A1.2 (Local fisher background characteristics -- Cont.)

	Survey Enumeration Items			
	ZAMBIA	TANZANIA	DEM. REPUBLIC OF CONGO	BURUNDI
2) Gender, age, and formal education All respondents in the Zambian fisher sample are male. Owners in both the artisanal and traditional fisheries tend to be older (majority >30 years) than their respective crew counterparts (majority <30 years). In terms of formal education, most sample respondents across all fisher categories do not hold a primary school certificate, although the incidence of certificate possession is slightly higher amongst the relatively younger crew population.	All respondents in the Tanzanian fisher sample are male. Owners in both the artisanal and traditional fisheries tend to be older (at least half >30 years) than their respective crew counterparts (majority <30 years). Except amongst traditional Rukwa Region crew, most fisher sample respondents report possession of a primary school certificate. Rukwa traditional crew are equally divided between those who do and do not hold a primary certificate.	All DRC fisher sample respondents are male. Artisanal owners tend to be older (majority >30 years) than artisanal crew members (majority <30 years). Levels of formal education attainment are relatively high, with most fishers in all categories reporting possession of a primary school certificate.	All respondents in the Burundian fisher sample are male. Artisanal owners are relatively older (majority >30 years) than either their crew counterparts or those in the traditional fisheries category (at least half <30 years). A considerable majority of all sample fishers (60%) apparently do not hold a primary certificate.
3) <i>Marital status and dependants</i> Most respondents are married and report bearing responsibility for at least one dependant, with markedly higher rates on both of these social obligation measures being registered by owners.	Most fisher respondents in all categories across both regions are married and report bearing responsibility for at least one dependant. Owners register as being married and responsible for the support of dependants somewhat more frequently than crew.	Considerable higher rates both of marriage and responsibility for support of dependants are found amongst traditional fishers and artisanal owners as compared with artisanal crew.	Incidence of marriage and responsibility for support of dependants is considerably higher amongst artisanal owners (100%) than those in other fisher categories (about 70% for artisanal crew and 60% for traditional fishers).
4	Place of birth and reasons for migration Fishers tend to originate from places other than their current landing site bases, except in the case of traditional owners. Wish 'to return to original family place' (place of parents' birth) most frequently given as reason for migration to present place of residence.	Except in the case of artisanal owners in Kigoma Region, most in the fisher sample claim their birthplace as somewhere other than their current landing site base. Most of those born elsewhere report they were motivated to settle in their present place of residence by a desire 'to return to original family place' (place of parents' birth).	Fishers tend to originate from their current landing site bases. Of those respondents born elsewhere, 'return to original family place' (place of parents' birth) is by far the most common reason cited for migration to sample landing sites.	Except for artisanal crew members, sample fishers for the most part report being born at or in the vicinity of their current places of residence. A wish 'to return to original family place' (place of parents' birth) is the most commonly cited reason for migration to site by those born elsewhere.

Table A1.2 (Local fisher background characteristics -- Cont.)

Survey Enumeration Items

ZAMBIA

TANZANIA

DEM. REPUBLIC OF CONGO

5) Fishing enterprise and income status

traditional) have more than ten years.

Secondary employment is common across have more than ten years. all categories of fishers, usually in the form of farming. Substantial majorities all types Secondary employment is common, of fishers claim access to at least some land, typically in the form of subsistence or though average parcel size is less than one combined food crop-cash crop farming. hectare.

Indicative information on estimated plot size is around one hectare in both monthly incomes during 'good' and regions. 'poor' fishing periods suggest a great disparity exists between artisanal owners Indicative information on estimated and crew. Owners are relatively much monthly incomes suggest a great disparity better off (roughly 2/3 making more than exists between artisanal owners and crew US\$ 200 (equivalent) per month net, during 'good' fishing periods in both versus 2/3 crew making less during 'good' regions. Roughly half of owners report periods). Within the traditional fishery, earning more than US\$ 200 (equivalent) situation almost reversed. Traditional crew net per 'good' month, compared with 90% seem to do somewhat less poorly than their of crew making less than this amount. owner counterparts (majority of owners Owner-crew 'good' period disparities are with a 'good' monthly income of US\$ 50 not nearly so noticeable within the net, versus majority of crew with amounts traditional fishery. During 'poor' periods, greater than this).

being involved with fishing full-time, both regions are involved with their involvement in fishing (activity that takes fisher categories claim full-time work in meaning this activity takes up the most fishing full-time (takes up most of their up most working time per month). fishing (takes up most working time per working time per month. A substantial working time per month). Total years of Artisanal crew as a group have less of a month). Contrary to patterns found majority of crew members (artisanal or involvement in fishing varies between the work history in fishing (majority less than elsewhere on the lake, artisanal crew tend traditional) have ten or less years of sub-groups. Whereas most crew members 10 years' experience) than do artisanal to have longer work histories in fishing experience in fishing work, whereas a (artisanal or traditional) have ten or less owners or traditional fishers. substantial majority of owners (artisanal or years of experience in fishing work, most owners (artisanal or traditional), except in (Data on fishers' secondary employment, experience).

> Substantial majorities of fishers of all types claim access to at least some land. Average

few sample fishers in any category seem to be making even modest amounts of money.

Virtually all fisher respondents report The vast majority of fisher respondents in Almost all sample fishers report full-time At least 80% of respondents across all

the case of traditional owners in Kigoma, land ownership, and estimated income were

DRC sector survey.)

(majority >10 years' experience) than artisanal owners (only half with >10 years'

BURUNDI

not systematically collected during the Across the sample as a whole, secondary employment most often takes the form of farming, either on a 'subsistence' basis only (i.e. for family food production) or in combination with some cash cropping.

> During 'good' months, the net income level of most artisanal fishers is reportedly higher (101-200 US\$ equivalent) than that of most traditional fishers (51-100 US\$ equivalent). During 'poor' fishing months, the artisanal-traditional differences are not so pronounced. Within the artisanal fishery itself, owner-crew disparities in estimated income levels are readily apparent for both 'good' and 'poor' earning periods.

Table A1.3 Lakewide summary of LTR SEC Survey findings: local fish processors/traders -- background characteristics.

Survey Enumeration Items			
ZAMBIA	TANZANIA	DEM. REPUBLIC OF CONGO	BURUNDI
1) Post-harvest sample composition			
The Zambian post-harvest sample group is composed of 110 individuals who mostly engage in fish processing and trading together, as opposed to specialising in one or the other.	The Tanzanian post-harvest sample group is composed of 177 individuals 119 from Kigoma Region and 58 from Rukwa. Most members of the group engage in fish processing and trading together, as opposed to specialising in one or the other.	A total of 82 individuals constitute the DRC post-harvest sample group. Most respondents engage in a combination of fish processing and trading.	The Burundi post-harvest sample comprises 62 individuals, some 60% of whom are specialised in trading only. About 20% are engaged in processing only, and another 20% combine processing and trading in their enterprise.
2) Gender, age, and formal education			
Post-harvest sample respondents are primarily female (78%). Male and female sub-group age structures are quite similar. About 40% of respondents are under 30 years, and about 80% under 40 years. Overall formal educational attainment is low, but post-harvest men tend to hold primary school certificates at a rate about double that of their women counterparts (42% vs. 20%).	Post-harvest sample respondents are primarily male (63%). Male and female sub-group age structures are quite similar in Kigoma Region (about half <30 years old). In Rukwa Region, women processors/traders are substantially younger than their male counterparts (72% <30 years versus 52% >30 years). Overall formal educational attainment is moderately high, though there are some gender-based differences. Whilst about 79% of Kigoma Region males have attained a primary school certificate, the corresponding figure for women is only	The sample group is about 56% female and 44% male. Roughly 20% of respondents (female or male) are under 30 years old; about 60% are under 40 years. Marked gender-based differences are apparent in terms of formal education achievements. Whilst some 58% of males have attained a primary school certificate, the corresponding figure for women is only about 13%.	Post-harvest respondents are almost entirely male (87% versus 13% female). The age structure of both gender sub-groups shows that most respondents are over 30 years old. Only 21% of the total sample population reports possession of a primary school certificate (25% for women, 20% for men).
	about 46%. In Rukwa Region gender-		
	based educational attainment differences are far less striking at the primary level.		
3) Marital status and dependants			
Data on marital status and dependants confirm the post-harvest sample as a group of mature individuals with spouse and family obligations.	The Tanzanian post-harvest group primarily consists of individuals who are married and who bear responsibility for the support of at least one dependant. In Rukwa Region, however, only around half of women respondents are married compared to more than 80% of the men.	Around 90% of all respondents, male or female, report being married and bearing responsibility for support of at least one dependant.	Male post-harvest respondents tend by heavy margins to be married (87%) and responsible for the support of at least one dependant (94%). Women also are for the most part married (75%) and look after one or more dependants (86%).

Table A1.3 (Post-harvest group characteristics -- Cont.)

Survey Enumeration Items

•	ZAMBIA	TANZANIA	DEM. REPUBLIC OF CONGO	BURUNDI
4)	Processors/traders largely originate from places other than their current landing site bases. Most of those born elsewhere indicate a wish 'to return to their original family place' (place of parents' birth) as the	Around 60% of sample processors/traders in both regions originate from places other than their current landing site bases. In Kigoma Region, most of those born elsewhere indicate a wish 'to return to	Some 25% of the post-harvest group claim place of birth at or in the immediate vicinity of sample communities. Around 38% report their birthplace to be within a 50 km radius, and around 37% beyond a 50	All female informants and a slight majority (52%) of male informants report being born at the sample site where they were interviewed.
	motivation for their migration to their present place of residence.	their original family place' (place of parents' birth) as the motivation for their migration to their present place of residence. In Rukwa, a wish to engage in the fish business is the most frequently cited reason for migration.	km radius. Of those respondents born elsewhere, 'return to original family place' (place of parents' birth) is cited by almost two-thirds of female respondents as the reason for migration to sample landing sites; half of the male respondents migrated to their present place of residence in order 'to engage in the fish business.'	People born elsewhere most frequently cite the wish for 'better conditions' as the main reason for their migration to present place of residence. The second most frequent reason given is the wish 'to find opportunities in fishing or fish trading.'
5)	Fishing enterprise and income status		8.8	
	All respondents claim to be involved in fish processing/trading on a 'full-time' basis (takes up most working time per month). Women slightly lead men in terms of years of work experience (about 30% with more than 10 years' experience vs. 25% for men). A large majority segment of the post- harvest sample group takes part in fishing in one way or another as secondary employment (equipment or gear owners, or some fishing unit interest that may not involve direct participation in fishing trips). Farming is reported as secondary employment to a limited extent, though most respondents claim ownership of at least some land.	All respondents claim to be involved in fish processing/trading on a 'full-time' basis. Men in both regions slightly lead women in terms of years of work experience. 'Full-time' fish processing or trading employment may also be supplemented by other forms of work, especially in farming. Like their fisher sample counterparts, respondents in the post-harvest group usually own at least some land. Indicative information on estimated monthly incomes reveals that female post- harvest respondents generally earn less than their male counterparts during 'good' months. Most post-harvest respondents estimate making US\$ 100 (equivalent) or	A vast majority of the respondents claim to be involved in fish processing/trading on a 'full-time' basis. The proportion of women with ten or less years' experience is about 57%; the corresponding proportion for men is around 56%. (Data on post-harvest operators' secondary employment, land ownership, and estimated income were not systematically collected during the DRC sector survey.)	Over 90% of those interviewed claim 'full- time' involvement in fish processing/ trading. Men tend to have more years of experience in post-harvest work (63% with over ten years' experience versus 50% for women). Some 45% of respondents report secondary employment in either subsistence or combined food crop-cash crop farming. Just under a third claim secondary employment in some aspect of fishing (either as direct participants or as gear/equipment owners). A fair-sized majority (>60%) of respondents of both genders report ownership of at least some land, no matter how small the parcel.
	Indicative information on estimated monthly incomes during 'good' and 'poor' work periods do not reveal any marked differences based on gender. Most post-harvest respondents estimate making US\$ 100 (equivalent) or less net during 'good' months, and US\$ 50 or less during 'poor' months.	less net per month in the best periods, and US\$ 50 or less during the 'poor' periods.		Reported net monthly income levels for 'good' and 'poor' periods of work are relatively low. Respondents of both sexes mostly (>55%) earn the equivalent of US\$50 or less during 'good' periods. Three quarters of all respondents earn US\$ 20 or less during 'poor' periods.

Table A1.4 Lakewide summary of LTR SEC Survey findings: local fishers -- opinions/views on sector problems and prospects.

Survey Enumeration Items

TANZANIA

DEM. REPUBLIC OF CONGO

BURUNDI

1) Personal circumstances and preferences

ZAMBIA

Most respondents across all fisher Most respondents in all fisher categories Almost all sample fishers claim a Most respondents disposed to continue in categories disposed to continue in present indicate wish to continue with present line commitment to stay in fishing work, mostly fishing. Artisanal crew are most affirmative occupation, and for the most part at present of work in present place of operation. base of operation.

towards

SO.

Commitment to fishing further reflected in especially reflected in patterns of stated preference patterns for use of a hypothetical preferences for use of a hypothetical one Future commitment to occupation is not to operate out of their present location. one year's saved earnings. Stated use year's saved earnings amongst Kigoma strongly evident in patterns of use preferences across all fisher categories are sample fishers, who tend to put family preferences for a hypothetical one year's Commitment to continued involvement in very strongly linked to fishing gear and welfare purposes before fishing gear and worth of saved earnings. Family welfare, fishing is only weakly manifest according equipment investments.

However, commitment to fishing is not change their base of operations.

investments are stronger than for their fishers.

at their present sites. However, just under of this commitment (92%), followed by half of artisanal crew indicate a desire to traditional fishers (86%) and artisanal owners (82%). Burundian fishers also for most part affirm a preference for continuing

equipment investments. Rates at which business, and farming investments take to the 'use of one year's savings measure.' Rukwa sample fishers express favour precedence over fishing gear/equipment Stated use preferences across all categories gear/equipment-related themes in 'wish lists' mentioned by of fishers strongly linked to family welfare purposes (house improvements, children's education. etc.) and investments in a business or farming than to fishing-related items.

2) State of resources and use rights

Generally pessimistic appraisal of past and A negative view of past catch trends More than 80% of sample respondents in In general, fishers surveyed in Burundi expected catch trends within the fisher prevails, though many respondents can not all categories are of the view that catches seem to fairly pessimistic in their sample population. Over-fishing by local point to a specific factor to explain this have declined over the period since they assessments of recent catch trends. Decline and industrial fleets is the most frequent perceived state of affairs. Others split first started to engage in fishing. DRC is attributed either to overfishing, reason cited in support of these views.

between assigning the cause either to fishers as a group are not sure what the next environmental change, or to civil unrest 'poor fishing methods,' 'over-fishing,' or five years will bring. Some believe catches and security problems that cause beach 'environmental change.' In terms of will increase, some that catches will closures and population displacements. expectations for the near future, decrease or stay at the same level. Most There is no solid body of opinion about respondents in both regions tend to be choose not to venture any opinion at all. divided between believing that there will be a continued pattern of decline and not having any opinion on the matter.

Kigoma counterparts, but not emphatically

prospects for the immediate future. A considerable minority (40%) of artisanal owners and crew and traditional fishers say that catches are likely to increase. Others are divided between expecting decreases or plain uncertainty about what will happen.

Table A1.4 (Fishers' views -- Cont.)

Survey Enumeration Items

2)	ZAMBIA	TANZANIA	DEM. REPUBLIC OF CONGO	BURUNDI
2)	But of resources and use rights (cont.) With regard to resource use rights, sample Zambian fishers tend to think that whereas everybody ought to be allowed to fish in waters outside of their own immediate administrative district, they should not be allowed to fish in waters outside of their own country. Possible regulations on access gaar and methods	On the issue of fisheries use rights, sample Tanzanian fishers as a group do not seem to be strongly in favour of limiting access to the lake's resources. They are quite positive about allowing 'everyone to fish everywhere,' and about allowing 'everybody to fish in waters outside of their own immediate administrative district.' Opinion in the sample population is more evenly divided on the question of allowing people to fish in waters outside of their own country.	Most DRC fishers do not subscribe to the view that 'everybody should be allowed to fish everywhere.' Traditional fishers by a considerable majority (>60%) disagree with the idea that people should be allowed to fish outside of their immediate administrative districts, and by an even stronger majority (almost 80%) disagree that people should be allowed to fish outside of their own country. Most artisanal owners (>60%) agree that people should be allowed to fish outside of their own districts, whereas artisanal crew are divided on the matter. Majorities in both artisanal categories disagree that people should be allowed to fish outside of their own countries.	Most artisanal fishers (>60% of owners, >55% of crew) respond positively to the proposition that 'everyone should be allowed to fish everywhere' on the lake. Opinion amongst traditionals is divided. Large majorities of all fishers (>70%) agree that people should be allowed to fish outside of their immediate administrative districts, and even outside of their own countries.
5)	 bistice regulations on access, gear, and methods Data on respondents' views vis-à-vis possible measures to regulate access to the fisheries or the use of certain fishing gear or methods show a remarkable degree of shared opinion within the sample population. Except for the question of possible closed seasons, on which opinion is divided, Zambian fishers interviewed seem strongly disposed to accept: a) some provision for closed fishing areas/reserves; b) some restriction of net mesh size generally and for specific types of nets including gillnets, beach seines, kapenta beach seines, lift nets, and chiromilla seines; c) some restriction on industrial fishing, beach seining, and lift netting; and d) an outright prohibition on 'active' gillnetting (beating or churning of water to scare fish into net). 	 A polling of fisher respondents' views on possible measures to regulate participation in the fisheries or the use of certain fishing gear or methods reveals moderate to strong majorities of fishers in all categories across both regions are opposed to: a) any provision for closed fishing seasons or times; b) any restriction of numbers of fishers; and c) any ban on beach seines or lift nets, or even any restriction (time or place) for their operation. 	 DRC fisher respondents are by considerable majority margins set against the imposition of any measures to: a) limit access by season; b) limit access through closed areas or reserves; c) restrict the number of operators allowed in the fishery; d) restrict mesh size generally or specifically for gillnets, beach seines, lift nets; or e) otherwise restrict or ban beach seining, lift netting, and 'active' gillnetting. Only on the question of industrial fishing is opinion somewhat divided. Artisanal owners are almost evenly split on whether industrial gear ought to be restricted or banned outright, whereas most artisanal crew and traditional fishers are against these propositions. 	 Burundian sample fishers as a group are quite decidedly against measures that would: a) limit access by season; b) limit access through closed areas or reserves; c) restrict the number of operators allowed in the fishery; d) prohibit the use of beach seines; e) ban or otherwise restrict the operations of lift nets; or f) prohibit 'active' gillnetting. Opinion is divided on the issue of general restriction of mesh sizes. Most artisanal fishers agree, whereas traditional fishers are evenly split in agreeing and disagreeing. On the other hand, both categories of fishers are moderately to strongly opposed to the imposition of mesh size restrictions on specific types of nets (gillnets, beach seines, and lift nets).

Table A1.4 (Fishers' views -- Cont.)

Survey Enumeration Items

ZAMBIA TANZANIA **DEM. REPUBLIC OF CONGO** BURUNDI 3) Possible regulations on access, gear, and methods (Cont.) Zambian fishers interviewed are strongly At the same time, the principle that some There is general agreement on the disposed to reject attempts to impose: kinds of restrictions should apply seems to suggestion to restrict industrial fishing a) limitations on numbers of fishers be generally accepted. Sample fishers operations, but no overall consensus on allowed: and appear to be quite soundly in favour of whether to ban such fishing altogether. b) outright banning of industrial gear, restrictions on minimum mesh sizes for Artisanal crew are in favour: artisanal beach seines, or lift nets. gillnets, beach seines, kapenta beach owners are not. Traditional fishers are seines. and lift nets. evenly divided on the issue. Reaction to other possible measures is less Opinion is also divided on whether or not uniform. Opinion is divided over the restrictions ought to placed on beach questions of establishing closed fishing seining operations. A slight majority of areas/reserves, restricting the use of artisanal owners are in favour of this move. industrial gear or prohibiting it altogether, Considerable majorities (>60%) of and banning of 'active' gillnetting artisanal crew and traditional fishers are (beating on water to scare fish into net). against it. 4) Role of government and fisheries authorities Appears to be a strong measure of Fishers are mostly of the view that Majority opinion is strongly in favour of Burundi fishers firmly support (70% to sentiment against the idea that fishing regulatory measures ought to be a matter of the idea that 'fishing rules should only be over 90% majority range) the idea that rules 'should only be decided by the shared responsibility between officials and decided by the Government,' on grounds 'fishing rules should only be decided by Government.' Fishers substantially of the local user communities. As for possible that this is a proper responsibility for the the Government,' on grounds that this is view that regulatory measures ought to be fisheries enforcement mechanisms, there is state to assume. properly a responsibility for the state to a matter of shared responsibility between strong consensus in favour of: assume. officials and local user communities. a) more fisheries patrol boats; Polling on possible fisheries enforcement punishment of fishers who violate mechanisms shows very solid support for There is also firm support for fisheries b) regulations (fines, gear confiscation, actions to: enforcement mechanisms that would With regard to possible fisheries enforcement mechanisms, sample fishers and /or withdrawal of fishing permit); a) increase the number of fisheries patrol involve: show strong solidarity in advocating that: and boats and fisheries scouts: a) increasing fisheries patrol boats and a) there should be more fisheries patrol c) punish offending fishers (fines, gear fisheries scouts; punishment of traders and consumers b) confiscation, and /or withdrawal of b) boats: who violate regulations (fines. punishing fishers who violate product confiscation. and/ b) there should be more fisheries scouts or fishing permit); and regulations (fines, gear confiscation, withdrawal of trading permit). punish offending and /or withdrawal of fishing permit): to help with enforcement: c) traders and c) police should not be more directly consumers (fines. product and involved in the enforcement of Group majority opinion is less solid but confiscation, and/ or withdrawal of c) punishing traders and consumers who still in favour of the proposition that there violate regulations (fines, product trading permit). fisheries regulations; d) there should be punishment of fishers should be 'more fishery scouts for confiscation, and/ or withdrawal of who violate regulations (fines, gear enforcement.' Opinion is moderately to Opinion is strongly against more direct trading permit). confiscation, and/or withdrawal of strongly in favour of the idea of 'more police involvement in fisheries direct police involvement in fishery enforcement, however. Half of Burundi sample traditional fishers fishing permit); and there should be punishment of traders enforcement' amongst all Kigoma fisher and slight to moderate majorities of e) violate sample respondents and amongst artisanal artisanal fishers disagree with the idea of and consumers who product fisher respondents in Rukwa. Traditional involving the police more directly in regulations (fines. confiscation, and/or withdrawal of Rukwa fishers are generally opposed to it. fisheries enforcement.

trading permit).

Table A1.4 (Fishers' views -- Cont.)

ZAMBIA	TANZANIA	DEM. REPUBLIC OF CONGO	BURUNDI
) Obstacles to occupational success			
Widely shared sense of frustration with gear availability problems (in terms of both quantity and quality) and with low catch and profit levels.	Much concern expressed over security situation on the lake. Also evident is a great deal of worry over gear problems (lack of availability or inadequate availability).	Lack of gear or its inadequate availability is far the most common obstacle to occupational success mentioned by DRC sample fishers. Security problems (theft, harassment by military personnel, etc.) is the second most common obstacle mentioned.	Artisanal owners tend to view security problems (theft, harassment by military personnel, etc.) as the most serious obstacles to their occupational success For artisanal crew and traditional fishers lack of gear or inadequate availability in sufficient quantity or quality are mos frequently cited as principal obstacles.
			frequently cited as principal obstacles.

Survey Enumeration Items

	ZAMBIA	TANZANIA	DEM. REPUBLIC OF CONGO	BURUNDI
1) Persona	l circumstances and preferences			
	Post-harvest group respondents of both sexes are very strongly inclined to stay	Respondents of both sexes are very strongly inclined to stick with	Post-harvest group respondents of both seves are very strongly inclined to stay	Over two thirds of the post-harvest group express a desire to continue with their
	with their present line of work, though	processing/trading, though just under	with their present line of work, usually	present line of work. Respondents as a
	over a third of male respondents claim a preference for operating out of some other location than their current base.	30% of the Rukwa sample claim a preference for operating out of some other location than their present one.	of their present location.	on in their present bases of operation.
		ioration than their present one.	Amongst male respondents, a strong	Stated preferences for use of a year's
	Commitment to fishing-related work is further reflected in patterns of stated	Some commitment to fishing-related work is further reflected in patterns of stated	commitment to fishing-related work is further reflected in stated use preferences for	savings from work earnings reinforce the impression of commitment to fishing-
	preferences for use of a hypothetical one year's saved earnings. Stated use	preferences for use of a hypothetical one vear's saved earnings amongst female	use of a hypothetical year's worth of savings. First preference mentions related	related jobs. As a first order preference, the majority of respondents opts for investment
	preferences of post-harvest informants are	informants in Kigoma Region, who tend to	to the acquisition either of gear (nets, lines,	either in fishing gear/equipment or in
	dominated by fishing gear and equipment	mention fish processing and trading	etc.), fishing lamps, boats, or outboard	further processing/trading activity.
	investment themes.	investment themes. Male informants in	engines are recorded for about 45% of male	
		Kigoma region appear to give family	processors/ traders. Female respondents	
		welfare purposes highest priority. Family	incline towards investment in farming	
		welfare also figures prominently for both	equipment as a first order preference.	
		sexes in Rukwa.		

Table A1.5 (Post-harvest group views -- Cont.)

Survey Enumeration Items

2)	ZAMBIA	TANZANIA	DEM. REPUBLIC OF CONGO	BURUNDI
2)	State of resources and use rights Some 96% of the post-harvest sample group are of the opinion that that catches have declined from the time they first became involved in the fish business, and 80% do not see any change for the better coming within the next 5 years. Just as for the fisher sample, post-harvest group respondents tend to regard the sheer pressure of too much fishing as the primary factor that explains catch declines in the past, and that will continue to provoke declines in the future. With regard to resource use rights, Zambian fish processors/traders are as a group extremely opposed to the propositions that 'everybody ought to be allowed to fish in waters outside of their own immediate administrative district,' and 'everybody ought to be allowed to fish in waters outside of their own country.'	Almost 96% of the post-harvest sample group reportedly think that catches have declined from the time they first became involved in the fish business. The sheer pressure of too much fishing is taken as the primary factor explaining recent catch declines. Much more uncertainty exists in relation to what future trends will be, with many respondents venturing no opinion at all and the others split on whether catches will increase or decrease. With regard to use rights, Tanzanian fish processors/traders are as a group not much in favour of any restriction on user access to the lake's fishery resources. Majority opinion supports the propositions that 'everybody ought to be allowed to fish everywhere,' and 'everybody ought to be allowed to fish in waters outside of their own immediate administrative district.' On the question of 'everybody ought to be allowed to fish in waters outside of their own country,' a fair majority of Kigoma respondents are in favour and a small majority of Rukwa respondents against.	Fish processors/ traders surveyed in the DRC appear to be extremely negative in remarking on changes in the fishery over recent years. Nearly 90% believe that catches have declined from the time they first became involved in the fish business. Nobody thinks that catches have increased over this period. Respondents tend to adopt a fatalistic ('it's God will') explanation for past catch decline. In terms of trends anticipated over the coming five years, the substantial majority (78%) of respondents chooses not to venture any opinion. DRC respondents follow up on their negative evaluations of past trends with support for propositions to limit access to the lake's fish resources. Substantial proportions are against suggestions that 'everyone should be allowed to fish everywhere,' or that people should be allowed to fish outside their own country, or even outside their own administrative district.	Almost two thirds of DRC informants are of the view that catches have decreased over the time since they first started in the fish business. Overfishing and associated stock decline along with problems of civil unrest are the factors thought to underlie this trend. A much more optimistic appraisal prevails amongst women in terms of future trends, with some 88% reporting that they believe catches will increase over the next five years, principally owing to expected improvements in the security situation. Male respondents appear less certain in their outlook. A large minority (46%) believes catches will increase, but others either think that they will decrease or have no opinion on the matter. Considerable majorities (>70%) of Burundian processors/traders would limit access to the lake's fisheries resources, in that they oppose suggestions that 'everybody should be allowed to fish everywhere,' or that people should be allowed to fish outside of their immediate administrative districts, or their own
3)	Possible regulations on access, gear, and methods			country.
	 There is amongst sample post-harvest operators substantial sentiment in favour of those measures which would impose: a) closed fishing periods or seasons; b) general restrictions on minimum mesh sizes allowed in the fishery; c) at least some restriction on beach seine operations; and d) at least some restriction on lift net 	Opinion varies across both gender and regional lines on measures which would impose closed fishing periods or places and restrictions on beach seine or industrial fishing operations. Strong support is registered for general measures to restrict mesh sizes.	 Moderate to substantial majorities of both male and female respondents oppose those measures which would: a) limit access by season or area; b) restrict the number of fishers allowed to operate; c) prohibit or otherwise restrict beach seine net operations; or d) prohibit or otherwise restrict lift net 	There is slight to moderate majority opinion in favour of propositions to limit mesh sizes generally (55%) and to impose some restrictions on industrial fishing operations (52%). A slight majority disapproves of the idea that industrial fishing ought to be banned, and considerable to substantial majorities disapprove of measures that would:

operations.

operations.

Table A1.5 (Post-harvest group views -- Cont.)

Survey Enumeration Items

	ZAMBIA	TANZANIA	DEM. REPUBLIC OF CONGO	BURUNDI
3)	Possible regulations on access, gear, and methods On other possible measures, opinion is divided as to whether it is worthwhile to establish closed fishing areas or reserves, and a moderate majority of processors/ traders oppose restrictions on the number of people allowed to fish. Most post- harvest respondents would support some form of restrictions on industrial fishing operations, but are opposed to an outright ban being placed on them. Opinion is heavily against any prohibition on beach seines or liftnets.	(Cont.) On the other hand, strong dissent is expressed over measures which would impose restrictions on lift net operations, or any outright ban on beach seining or lift netting. Moderate majorities of processors/ traders oppose restrictions on the number of people allowed to fish.	Respondent opinion is divided with regard to other possible measures. Women appear to be against general restrictions on minimum mesh sizes allowed in the fishery, and also against any prohibition on industrial fishing operations. Men seem to be in favour of such measures.	 a) limit access by seasonal or area closures; b) restrict the number of fishers allowed to operate; c) ban or otherwise restrict beach seine net operations; or d) ban or otherwise restrict lift net operations.
4)	 Role of government and fisheries authorities Local processors/traders as a group appear to be firmly set against the idea that fishing rules 'should only be decided by the Government,' primarily because they see that fishing restrictions should be approached as a shared responsibility between officials and local community members, and also because they think that fishers are the ones with the best knowledge of local conditions. With regard to possible fisheries enforcement mechanisms, post-harvest operators follow their fisher counterparts in strongly advocating that: a) there should be more fisheries patrol boats; b) there should be more fisheries scouts to help with enforcement; c) police should <u>not</u> be more directly involved in the enforcement of fisheries regulations; d) there should be punishment of fishers who violate regulations; who violate regulations; 	 Apart from male respondents in Kigoma Region, the post-harvest sample group as a whole appears to be moderately in favour of the proposition that fishing rules 'should only be decided by the Government' As for possible fisheries enforcement mechanisms, the post-harvest group generally follows the pattern of local sample fishers in advocating that: a) there should be more fisheries patrol boats; b) there should be more fisheries scouts to help with enforcement; c) police should be more directly involved in the enforcement of fisheries regulations; d) there should be punishment of fishers who violate regulations (fines, gear confiscation, and/or withdrawal of fishing permit); and e) there should be punishment of traders and consumers who violate regulations (fines, product confiscation, and/or withdrawal of trading permit). 	 A considerable majority (>70%) of DRC post-harvest respondents support the idea that fishing rules 'should only be decided by the Government.' There is moderate to very solid agreement with proposed enforcement mechanisms which would involve: a) increasing fisheries patrol boats; b) punishment of fishers who violate regulations (fines, gear confiscation, and/or withdrawal of fishing permit); and c) punishment of traders and consumers who violate regulations (fines, product confiscation, and/or withdrawal of trading permit). Female and male respondents views differ on the subjects of fisheries scouts and police control. Whereas male respondents agree with more fisheries scouts, a moderate majority of female respondent disagrees. The use of more police control is strongly advocated by female respondents. 	 Virtually all (94%) of Burundi postharvest informants identify with the suggestion that 'fishing rules should only be decided by the Government,' giving as their principal reason the observation that this is properly a state responsibility. Opinion is moderately to very firmly behind suggested enforcement mechanisms that would involve: a) increasing fisheries patrol boats; b) increasing the number of fisheries scouts; c) a more direct police role in ensuring compliance and control; d) punishment of fishers who violate regulations (fines, gear confiscation, and/or withdrawal of fishing permit); and e) punishment of traders and consumers who violate regulations (fines, product confiscation, and/or withdrawal of trading permit).

Table A1.5 (Post-harvest group views -- Cont.)

Survey Enumeration Items

			DEMI, KEFUDLIC OF CONGO	BUKUNDI
5) Obstacles to occupational success				
5) Obstacles to occupational success Responses to a query of obstacles to occupational that problems associated and profit levels (e.g. 'p fish,' 'high prices of fish 'overfishing,' and 'catch fish') are dominant wor post-harvest group.	n most serious Problems ass success indicate profit levels with low catches 'high prices oor supplies of 'overfishing, ,' 'low income,' fish') are do ing of juvenile post-harvest ries within the problems,' i and/or high storage and/o simple low o principal o respondents	ociated with low catches and (e.g. 'poor supplies of fish,' s of fish,' 'low income,' ' and 'catching of juvenile ominant worries for women respondents. 'Marketing ncluding lack of transport transport costs, and poor or selling facilities as well as demand for product, are the obstacle to most male in Kigoma Region. For the	A tabulation of responses to the query on 'most serious obstacles faced in your occupation' indicates that problems associated with low catches and profit levels (e.g. 'poor supplies of fish,' 'high prices of fish,' 'low income,' 'overfishing,' and 'catching of juvenile fish') are dominant worries within the post-harvest group.	Respondents most frequently mention problems of 'low catches/profit' as the most serious obstacle they face in pursuing their occupations as processors/traders. They also point out 'security problems' (theft, civil unrest, and harassment by police or military personnel, etc.) and 'marketing problems' (lack of transport and/or high transport costs, and poor storage and/or selling facilities as well as simple low demand for product) as common sources of concern.
	Rukwa male j revolving arc which may ir harassment by figure as the n	post-harvest sample, problems bund the 'lack of security,' include theft, civil unrest, and y police or military personnel, most common concern		

ANNEX 2

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Yes' %	89.4	71.1	73.2	80.2	64.5
'No' %	10.6	28.9	25.9	19.1	35.5
'No opinion' %	0	0	0.9	0.7	0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	123	76	220	131	93
Missing cases	2	2	0	0	0

ADDITIONAL STATISTICAL TABLES -- 1997 LAKEWIDE SEC SURVEY

Stated preference for continuing in fishing occupation, Artisanal fishers

Table A2.1a

 Table A2.1b
 Stated preference for continuing in fishing occupation, Traditional fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Yes' %	85.7	90.5	76.5	88.4	77.5
'No' %	14.3	9.5	23.5	11.6	22.5
'No opinion' %	0	0.0	0	0.0	0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	28	21	81	43	102
Missing cases	2	0	0	0	0

 Table A2.1c
 Stated preference for continuing in fish business, Post-harvest operators

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Yes' %	67.7	80.5	91.6	81.0	90
'No' %	30.6	19.5	8.4	19.0	9.1
'No opinion' %	1.6	0.0	0	0.0	0.9
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	62	82	119	58	110
Missing cases	0	0	0	0	0

 Table A2.2a
 Stated preference for staying in present location, Artisanal fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Yes' %	70.5	59.6	71.4	64.9	58.1
'No' %	28.7	37.7	27.7	34.3	40.8
'No opinion' %	0.8	2.7	0.9	0.8	0.1
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	122	74	220	131	93
Missing cases	3	4	0	0	0

Totals may not exactly equal 100.0% due to rounding.

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Yes' %	78.6	80.9	71.6	93.0	77.2
'No' %	17.9	19.1	27.2	7.0	22.8
'No opinion' %	3.5	0.0	1.2	0.0	0.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	28	21	81	43	102
Missing cases	2	0	0	0	0

Stated preference for staying in present location, Traditional fishers Table A2.2b

 Table A2.2c
 Stated preference for staying in present location, Post-harvest operators

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Yes' %	72.6	67.1	84.9	67.2	90.0
'No' %	25.8	22.0	14.3	29.3	9.1
'No opinion' %	1.6	11.0	0.8	3.4	0.9
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	62	82	119	58	110
Missing cases	0	0	0	0	0

 Table A2.3a
 View on allowing everyone to fish everywhere in lake, Artisanal fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Yes' %	58.6	29.9	73.1	74.0	50.5
'No' %	39.8	64.9	24.7	21.4	41.9
'No opinion' %	1.6	5.2	2.3	4.6	7.5
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	123	77	219	131	93
Missing cases	2	1	1	0	0

 Table A2.3b
 View on allowing everyone to fish everywhere in lake, Traditional fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Yes' %	46.7	40.0	80.2	79.1	42.2
'No' %	50	55.0	16.1	20.9	45.1
'No opinion' %	3.3	5.0	3.7	0.0	12.7
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	30	20	81	43	102
Missing cases	0	1	0	0	0

 Table A2.3c
 View on allowing everyone to fish everywhere in lake, Post-harvest operators

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Yes' %	72.6	4.9	69.7	55.2	32.7
'No' %	25.8	87.8	26.1	43.1	64.5
'No opinion' %	1.6	7.3	4.2	1.7	2.7
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	62	82	119	58	110
Missing cases	0	0	0	0	0
Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
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'Yes' %	75.8	54.5	93.2	93.1	65.6
'No' %	23.4	40.3	5.9	6.1	33.3
'No opinion' %	0.8	5.2	0.9	0.8	1.1
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	124	77	220	131	93
Missing cases	1	1	0	0	0

Table A2.4a View on allowing people to fish outside own district, Artisanal fishers

 Table A2.4b
 View on allowing people to fish outside own district, Traditional fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Yes' %	73.3	36.8	90.1	81.4	68.6
'No' %	26.7	63.2	8.6	18.6	29.4
'No opinion' %	0	0.0	1.2	0.0	2
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	30	19	81	43	102
Missing cases	0	2	0	0	0

 Table A2.4c
 View on allowing people to fish outside own district, Post-harvest operators

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Yes' %	88.7	24.4	86.6	81.0	16.4
'No' %	9.7	67.1	10.9	19.0	82.7
'No opinion' %	1.6	8.5	2.5	0.0	0.9
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	62	82	119	58	110
Missing cases	0	0	0	0	0

 Table A2.5a
 View on allowing people to fish outside own country, Artisanal fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Yes' %	71.5	27.6	52.3	51.9	30.1
'No' %	27.6	59.2	46.8	48.1	68.8
'No opinion' %	0.9	13.2	0.9	0.0	1.1
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	123	76	220	131	93
Missing cases	2	2	0	0	0

 Table A2.5b
 View on allowing people to fish outside own country, Traditional fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Yes' %	73.3	21.1	56.8	25.6	25.5
'No' %	26.7	78.9	43.2	72.1	73.5
'No opinion' %	0.0	0.0	0.0	2.3	1.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	30	19	81	43	102
Missing cases	0	2	0	0	0

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Yes' %	82.3	14.6	55.5	46.6	5.5
'No' %	16.1	75.6	41.2	51.7	94.5
'No opinion' %	1.6	9.8	2.8	1.7	0.0
- Total %	100.0	100.0	100.0	100.0	100.0
Report cases	62	82	119	58	110
Missing cases	0	0	0	0	0

View on allowing people to fish outside own country, Post-harvest operators Table A2.5c

 Table A2.6a
 View on always enough fish for everybody in future, Artisanal fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Yes' %	57.0	30.6	33.6	22.9	19.4
'No' %	40.5	62.5	35.9	42.7	73.1
'No opinion' %	2.5	6.9	30.5	3.4	7.5
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	121	72	220	131	93
Missing cases	4	6	0	0	0

 Table A2.6b
 View on always enough fish for everybody in future, Traditional fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Yes' %	48.3	20.0	30.9	16.3	21.6
'No' %	44.8	80.0	33.3	53.5	73.5
'No opinion' %	6.9	0.0	35.8	30.2	4.9
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	29	20	81	43	102
Missing cases	1	1	0	0	0

 Table A2.6c
 View on always enough fish for everybody in future, Post-harvest operators

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Yes' %	59.7	2.4	33.6	31.0	6.4
'No' %	30.6	84.1	37	50.0	83.6
'No opinion' %	9.7	13.4	29.4	19.0	10.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	62	82	119	58	110
Missing cases	0	0	0	0	0

 Table A2.7a
 Reasons cited for catch decrease from before, sample fisher groups

	Bur	undi	DI	RC*	Tz/K	igoma	Tz/R	ukwa	Za	nbia
Reason cited	A/Fish	T/Fish								
'Don't know' %	5.3	0.0	n/a	n/a	29.3	31.0	38.4	33.3	2.4	2.2
'God's will' %	1.8	0.0	n/a	n/a	1.3	2.8	3.5	3.0	0.0	1.1
'Overfishing/stock decline' %	28.1	30.8	n/a	n/a	17.2	21.1	24.4	24.2	66.7	70.8
'Industrial fishing' %	0.0	0.0	n/a	n/a	3.2	2.8	0.0	3.0	15.5	14.6
'Use of small mesh sizes' %	0.0	0.0	n/a	n/a	0.6	0.0	0.0	3.0	4.8	3.4
'Presence foreign fishers' %	0.0	0.0	n/a	n/a	0.6	0.0	0.0	0.0	0.0	0.0
'Poor fishing methods' %	10.5	0.0	n/a	n/a	33.8	31.0	22.1	21.2	6.0	2.2
'Environmental change' %	10.5	46.2	n/a	n/a	14.0	11.3	11.6	12.1	3.6	5.6
'Regulations weak' %	0.0	0.0	n/a	n/a	0.0	0.0	0.0	0.0	1.2	0.0
'Improved gear' %	0.0	0.0	n/a	n/a	0.0	0.0	0.0	0.0	0.0	0.0
'Security problems' %	43.9	23.0	n/a	n/a	0.0	0.0	0.0	0.0	0.0	0.0
Total %	100.0	100.0	n/a	n/a	100.0	100.0	100.0	100.0	100.0	100.0
Report cases	57	13	n/a	n/a	157	71	86	33	84	89
Missing cases	9	5	n/a	n/a	16	1	2	1	1	1

* For the DRC, information collected on fisher respondents' reasons contains many missing cases and is therefore not tabulated.

 Table A2.7b
 Reasons cited for catch decrease from before, sample post-harvest groups

Reason cited	Burundi P/Hvst	DRC P/Hvst	Tz/Kigoma P/Hvst	Tz/Rukwa P/Hvst	Zambia P/Hvst
'Don't know' %	0.0	0.0	0.0	0.0	0.0
'God's will' %	0.0	59.1	30.5	35.0	5.7
'Overfishing/stock decline'	52.8	24.0	37.1	32.5	76.2
%					
'Industrial fishing' %	2.8	2.8	0.0	2.5	6.7
'Use of small mesh sizes' %	0.0	0.0	0.0	0.0	0.0
'Presence foreign fishers' %	0.0	0.0	0.0	0.0	0.0
'Poor fishing methods' %	13.9	5.6	24.8	20.0	4.8
'Environmental change' %	5.6	5.6	7.6	7.5	6.7
'Regulations weak' %	0.0	0.0	0.0	0.0	0.0
'Improved gear' %	2.8	1.4	0.0	0.0	0.0
'Security problems' %	22.1	1.4	0.0	0.0	0.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	36	71	105	40	105
Missing cases	5	5	0	0	0

 Table A2.8a
 View on closed seasons/times, Artisanal fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	30.3	10.5	26.6	39.7	63
'Disagree' %	69.7	88.2	67.4	58.0	35.9
'No opinion' %	0	1.3	6.0	2.3	1.1
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	119	76	218	131	92
Missing cases	6	2	2	0	1

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Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	30	15.0	27.2	39.5	62.7
'Disagree' %	70	85.0	69.1	60.5	36.3
'No opinion' %	0.0	0.0	3.7	0.0	1.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	30	20	81	43	102
Missing cases	0	1	0	0	0

View on closed seasons/times, Traditional fishers Table A2.8b

 Table A2.8c
 View on closed seasons/times, Post-harvest operators

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	19.4	6.1	42.0	62.1	64.5
'Disagree' %	75.8	91.5	49.6	31.0	35.5
'No opinion' %	4.8	2.4	8.4	6.9	0.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	62	82	119	58	110
Missing cases	0	0	0	0	0

 Table A2.9a
 View on closed areas/places, Artisanal fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	25.0	7.9	33.8	42.7	79.6
'Disagree' %	75	90.8	44.7	32.8	20.4
'No opinion' %	0.0	1.3	1.5	24.4	0.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	120	76	219	131	93
Missing cases	5	2	1	0	0

 Table A2.9b
 View on closed areas/places, Traditional fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	24.1	25.0	44.4	34.9	79.4
'Disagree' %	69	75.0	43.2	46.5	17.6
'No opinion' %	6.9	0.0	12.3	18.6	2.9
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	29	20	81	43	102
Missing cases	1	1	0	0	0

 Table A2.9c
 View on closed areas/places, Post-harvest operators

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
F					
'Agree' %	17.7	12.2	47.9	63.8	45.4
'Disagree' %	77.4	78.0	37.0	29.3	48.2
'No opinion' %	4.8	9.8	15.1	6.9	6.4
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	62	82	119	58	110
Missing cases	0	0	0	0	0

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	8.9	6.6	16.9	11.4	22.8
'Disagree' %	91.1	93.4	78.5	86.3	77.2
'No opinion' %	0.0	0.0	4.6	2.3	0.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	123	76	219	131	92
Missing cases	2	2	1	0	1

 Table A2.10a
 View on restriction of numbers of fishers, Artisanal fishers

 Table A2.10b
 View on restriction of numbers of fishers, Traditional fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	10	10.0	9.9	14.0	22.5
'Disagree' %	90	85.0	85.2	81.4	74.5
'No opinion' %	0.0	5.0	4.9	4.6	3.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	30	20	81	43	102
Missing cases	0	1	0	0	0

 Table A2.10c
 View on restriction of numbers of fishers, Post-harvest operators

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	16.1	3.7	28.6	25.9	38.2
'Disagree' %	80.6	95.1	62.2	56.9	55.5
'No opinion' %	3.2	1.2	9.2	17.2	6.4
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	62	82	119	58	110
Missing cases	0	0	0	0	0

 Table A2.11a
 View on restriction of mesh sizes, Artisanal fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	59.2	17.1	73.6	81.9	97.8
'Disagree' %	39.2	82.9	23.5	17.3	1.1
'No opinion' %	1.6	0.0	2.9	0.8	1.1
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	120	76	208	127	93
Missing cases	5	2	12	4	0

 Table A2.11b
 View on restriction of mesh sizes, Traditional fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	46.7	20.0	80.3	94.1	99.0
'Disagree' %	46.7	80.0	19.7	5.9	0.0
'No opinion' %	6.6	0.0	0.0	0.0	1.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	30	20	71	34	102
Missing cases	0	1	10	9	0

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	54.8	42.7	68.9	74.1	100.0
'Disagree' %	30.6	43.9	21.0	10.3	0.0
'No opinion' %	14.6	13.4	10.1	15.6	0.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	62	82	119	58	110
Missing cases	0	0	0	0	0

 Table A2.11c
 View on restriction of mesh sizes, Post-harvest operators

 Table A2.12a
 View on restriction of industrial gear operations, Artisanal fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	71.4	45.5	39.5	51.9	87.1
'Disagree' %	26.1	53.2	54.5	42.0	11.8
'No opinion' %	2.5	1.3	6.0	6.1	1.1
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	119	77	220	131	93
Missing cases	6	1	0	0	0

 Table A2.12b
 View on restriction of industrial gear operations, Traditional fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	72.4	40.0	40.7	60.5	94.1
'Disagree' %	27.6	60.0	53.1	34.9	4.9
'No opinion' %	0.0	0.0	6.2	4.6	1.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	29	20	81	43	102
Missing cases	1	1	0	0	0

 Table A2.12c
 View on restriction of industrial gear operations, Post-harvest operators

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	51.6	6.1	50.4	56.9	55.5
'Disagree' %	35.5	87.8	32.8	20.7	38.2
'No opinion' %	8.9	6.1	16.8	22.4	6.3
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	62	82	119	58	110
Missing cases	0	0	0	0	0

 Table A2.13a
 View on prohibition of industrial gear operations, Artisanal fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
response	Durunui	ZNU		12/13/19/U	Zaniolu
'Agree' %	50.0	44.2	18.1	44.3	26.9
'Disagree' %	48.4	54.5	75.5	51.1	72
'No opinion' %	1.6	1.3	6.3	4.6	1.1
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	122	77	220	131	93
Missing cases	3	1	0	0	0

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	50.0	30.0	29.6	53.5	25.5
'Disagree' %	50.0	70.0	64.2	44.2	72.5
'No opinion' %	0.0	0.0	6.2	2.3	2.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	30	20	81	43	102
Missing cases	0	1	0	0	0

 Table A2.13b
 View on prohibition of industrial gear operations, Traditional fishers

 Table A2.13c
 View on prohibition of industrial gear operations, Post-harvest operators

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
· A gree' %	35 5	463	10.3	<i>A</i> 1 <i>A</i>	39.1
'Disagree' %	51.6	50.0	67.2	37.9	57.3
'No opinion' %	12.9	3.7	13.5	20.7	3.6
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	62	82	119	58	110
Missing cases	0	0	0	0	0

 Table A2.14a
 View on restriction of beach seine operations, Artisanal fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	39.8	6.6	24.5	19.1	93.5
'Disagree' %	58.5	93.4	74.5	80.1	5.4
'No opinion' %	1.6	0.0	1.0	0.8	1.1
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	123	76	220	131	92
Missing cases	2	2	0	0	1

 Table A2.14b
 View on restriction of beach seine operations, Traditional fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	23.3	5.0	20	30.2	94.1
'Disagree' %	73.3	95.0	78.8	69.8	4.9
'No opinion' %	3.4	0.0	1.2	0.0	1.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	29	20	80	43	102
Missing cases	1	1	1	0	0

 Table A2.14c
 View on restriction of beach seine operations, Post-harvest operators

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	16.1	6.1	37.0	50.0	80
'Disagree' %	72.6	91.5	48.7	34.5	18.2
'No opinion' %	11.3	2.4	14.3	15.5	1.8
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	62	82	119	58	110
Missing cases	0	0	0	0	0

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	13.8	3.9	6.4	6.9	2.2
'Disagree' %	86.2	96.1	93.2	91.6	96.8
'No opinion' %	0.0	0.0	0.4	1.5	1.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	123	77	220	131	93
Missing cases	2	1	0	0	0

 Table A2.15a
 View on prohibition of beach seine operations, Artisanal fishers

 Table A2.15b
 View on prohibition of beach seine operations, Traditional fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	6.7	5.0	7.4	14.0	7.8
'Disagree' %	90.0	95.0	90.1	83.7	91.2
'No opinion' %	3.3	0.0	2.5	2.3	1.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	30	20	81	43	102
Missing cases	0	1	0	0	0

 Table A2.15c
 View on prohibition of beach seine operations, Post-harvest operators

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	0.0	0.0	10.9	25.9	17.3
'Disagree' %	88.7	97.6	75.6	60.3	80.9
'No opinion' %	11.3	2.4	13.5	13.8	1.8
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	62	82	119	58	110
Missing cases	0	0	0	0	0

 Table A2.16a
 View on restriction of lift net operations, Artisanal fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	31.7	3.9	11.4	13.7	91.4
'Disagree' %	67.5	96.1	88.6	83.2	7.5
'No opinion' %	0.8	0.0	0.0	3.1	1.1
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	123	76	220	131	92
Missing cases	2	2	0	0	1

 Table A2.16b
 View on restriction of lift net operations, Traditional fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	20.0	10.0	12.3	16.3	91.2
'Disagree' %	80.0	90.0	86.4	79.1	7.8
'No opinion' %	3.4	0.0	3.1	4.6	1.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	30	20	80	43	102
Missing cases	0	1	1	0	0

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	19.4	6.1	23.5	44.8	63.6
'Disagree' %	69.4	91.5	63.9	39.7	21.8
'No opinion' %	11.2	2.4	12.6	15.5	14.6
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	62	82	119	58	110
Missing cases	0	0	0	0	0

 Table A2.16c
 View on restriction of lift net operations, Post-harvest operators

 Table A2.17a
 View on prohibition of lift net operations, Artisanal fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	8.1	3.9	3.6	3.0	6.5
'Disagree' %	91.9	96.1	96.4	94.7	92.5
'No opinion' %	0.0	0.0	0.0	2.3	1.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	123	77	220	131	93
Missing cases	2	1	0	0	0

 Table A2.17b
 View on prohibition of lift net operations, Traditional fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	3.4	25.0	7.4	7.0	5.9
'Disagree' %	96.6	75.0	91.4	88.4	93.1
'No opinion' %	0.0	0.0	1.2	4.6	1.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	30	20	81	43	102
Missing cases	0	1	0	0	0

 Table A2.17c
 View on prohibition of lift net operations, Post-harvest operators

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	0.0	0.0	5.9	25.9	20
'Disagree' %	88.7	97.6	56.3	55.2	68.2
'No opinion' %	11.3	2.4	37.8	18.9	11.8
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	62	82	119	58	110
Missing cases	0	0	0	0	0

 Table A2.18a
 View on restriction of gillnet mesh size, Artisanal fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
•			0		
'Agree' %	46.3	15.8	69.1	81.7	93.5
'Disagree' %	52.9	84.2	27.7	17.5	5.4
'No opinion' %	0.8	0	3.2	0.8	1.1
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	121	76	220	131	93
Missing cases	4	2	0	0	0

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	33.3	25.0	77.8	86.0	96.1
'Disagree' %	63.3	75.0	21.0	14.0	2.9
'No opinion' %	3.3	0.0	1.2	0.0	1.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	30	20	81	43	102
Missing cases	0	1	0	0	0

 Table A2.18b
 View on restriction of gillnet mesh size, Traditional fishers

 Table A2.19a
 View on restriction of beach seine mesh size, Artisanal fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	43.0	16.0	67.0	77.9	92.5
'Disagree' %	55.4	84.0	28.0	22.1	6.5
'No opinion' %	1.6	0.0	5.0	0.0	1.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	121	75	218	131	93
Missing cases	4	3	2	0	0

 Table A2.19b
 View on restriction of beach seine mesh size, Traditional fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	30.0	20.0	69.1	90.7	97.0
'Disagree' %	66.7	80.0	29.6	7.0	2.0
'No opinion' %	3.3	0.0	1.2	2.3	1.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	30	20	81	43	102
Missing cases	0	1	0	0	0

 Table A2.20a
 View on restriction of beach seine mesh size, Artisanal fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	37.2	15.8	63.6	74.0	94.6
'Disagree' %	62.0	84.2	32.7	19.1	4.3
'No opinion' %	0.8	0.0	3.6	6.9	1.1
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	121	76	220	131	93
Missing cases	4	2	0	0	0

 Table A2.20b
 View on restriction of beach seine mesh size, Traditional fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
P 0150		0	go		
'Agree' %	23.3	20.0	64.2	64.4	90.0
'Disagree' %	73.3	80.0	30.9	18.6	2.0
'No opinion' %	3.4	0.0	4.9	14.0	1.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	30	20	81	43	102
Missing cases	0	1	0	0	0

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	16.1	9.7	45.2	61.7	89.2
'Disagree' %	83.9	90.3	41.6	32.1	8.6
'No opinion' %	0.0	0.0	13.2	6.2	2.2
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	118	72	219	131	93
Missing cases	7	6	1	0	0

 Table A2.21a
 View on prohibition of 'katuli' fishing, Artisanal fishers

 Table A2.21b
 View on prohibition of 'katuli' fishing, Traditional fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	16.0	21.1	61.7	60.5	88.2
'Disagree' %	84.0	78.9	32.1	32.6	10.8
'No opinion' %	0.0	0.0	6.2	6.9	1.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	25	19	81	43	102
Missing cases	5	2	0	0	0

 Table A2.22a
 View on fishing regulations only to be decided by Government, Artisanal fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	88.6	85.3	27.7	35.1	31.2
'Disagree' %	10.6	13.3	57.7	53.4	68.8
'No opinion' %	0.8	1.3	14.5	11.5	0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	123	75	220	131	93
Missing cases	2	3	0	0	0

 Table A2.22b
 View on fishing regulations only to be decided by Government, Traditional fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	93.1	70.0	24.7	37.2	25.5
'Disagree' %	3.4	20.0	69.1	53.5	74.5
'No opinion' %	3.4	10.0	6.2	9.3	0.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	29	20	81	43	102
Missing cases	1	1	0	0	0

 Table A2.22c
 View on fishing regulations only to be decided by Government, Post-harvest operators

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	83.9	72.0	47.1	50.0	25.5
'Disagree' %	12.9	4.9	44.5	41.4	71.8
'No opinion' %	3.2	23.2	8.4	8.6	2.7
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	62	82	119	58	110
Missing cases	0	0	0	0	0

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	79.7	64.9	89.1	79.4	88.2
'Disagree' %	20.3	32.4	9.5	19.1	11.8
'No opinion' %	0.0	2.7	1.4	1.5	0.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	123	74	220	131	93
Missing cases	2	4	0	0	0

 Table A2.23a
 View on 'should be more fisheries patrol boats,' Artisanal fishers

 Table A2.23b
 View on 'should be more fisheries patrol boats,' Traditional fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	76.7	55.0	80.2	76.7	92.2
'Disagree' %	23.3	35.0	18.5	18.6	7.8
'No opinion' %	0.0	10.0	1.2	4.7	0.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	29	20	81	43	102
Missing cases	1	1	0	0	0

 Table A2.23c
 View on 'should be more fisheries patrol boats,' Post-harvest operators

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	62.9	59.8	73.9	75.9	76.4
'Disagree' %	27.4	24.4	20.2	19.0	23.6
'No opinion' %	9.7	15.8	5.9	5.1	0.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	62	82	119	58	110
Missing cases	0	0	0	0	0

 Table A2.24a
 View on 'more fisheries scouts for enforcement,' Artisanal fishers

Dosponso	Burundi	DPC	Tz/Kigomo	Tz/Dulzwo	Zambia
Kesponse	Durunui	DKC	1 Z/ Kiguina	1 L/ NUKWA	Zampia
'Agree' %	85.2	63.5	66.4	72.5	89.2
'Disagree' %	14.8	33.8	33.2	26.7	9.7
'No opinion' %	0.0	2.7	0.4	0.8	1.1
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	122	74	220	131	93
Missing cases	3	4	0	0	0

 Table A2.24b
 View on 'more fisheries scouts for enforcement,' Traditional fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	90.0	55.0	53.1	76.7	84.3
'Disagree' %	10	40.0	44.4	20.9	13.7
'No opinion' %	0.0	5.0	2.5	2.3	2.0
- Total %	100.0	100.0	100.0	100.0	100.0
Report cases	30	20	81	43	102
Missing cases	0	1	0	0	0

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	88.7	47.6	64.7	70.7	89.1
'Disagree' %	4.8	35.4	32.8	27.6	9.1
'No opinion' %	6.5	17.0	2.5	1.7	1.8
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	62	82	119	58	110
Missing cases	0	0	0	0	0

 Table A2.24c
 View on 'more fisheries scouts for enforcement,' Post-harvest operators

 Table A2.25a
 View on 'involve police more directly in fisheries enforcement,' Artisanal fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
		-			
'Agree' %	43.4	30.1	57.7	67.2	41.9
'Disagree' %	54.9	67.1	40.9	32.8	58.1
'No opinion' %	1.6	2.7	1.4	0.0	0.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	122	73	220	131	93
Missing cases	3	5	0	0	0

 Table A2.25b
 View on 'involve police more directly in fisheries enforcement,' Traditional fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	46.7	30.0	65.4	44.2	42.2
'Disagree' %	50.0	65.0	33.3	55.8	57.8
'No opinion' %	3.3	5.0	1.2	0.0	0.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	30	20	81	43	102
Missing cases	0	1	0	0	0

 Table A2.25c
 View on 'involve police more directly in fisheries enforcement,' Post-harvest operators

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	56.5	42.7	54.6	58.6	40.9
'Disagree' %	35.5	43.9	40.3	39.7	59.1
'No opinion' %	8.0	13.4	5.1	1.7	0.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	62	82	119	58	110
Missing cases	0	0	0	0	0

 Table A2.26a
 View on 'punish offending fishers,' Artisanal fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
		-			
'Agree' %	78.9	72.6	93.6	93.1	98.9
'Disagree' %	19.5	24.7	3.7	5.3	1.1
'No opinion' %	1.6	2.7	2.7	1.5	0.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	123	73	220	131	93
Missing cases	2	5	0	0	0

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	80.0	68.4	96.3	95.2	100.0
'Disagree' %	20.0	26.3	2.5	4.8	0.0
'No opinion' %	0.0	5.3	1.2	0.0	0.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	30	19	80	42	102
Missing cases	0	2	1	1	0

 Table A2.26b
 View on 'punish offending fishers,' Traditional fishers

 Table A2.26c
 View on 'punish offending fishers,' Post-harvest operators

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	95.2	87.8	88.2	89.7	99.1
'Disagree' %	3.2	2.4	5.0	8.6	0.9
'No opinion' %	1.6	9.8	6.8	1.7	0.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	62	82	119	58	110
Missing cases	0	0	0	0	0

 Table A2.27a
 View on 'punish offending traders/consumers,' Artisanal fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	96.7	71.2	95.0	93.1	95.7
'Disagree' %	2.5	24.7	0.9	5.3	4.3
'No opinion' %	0.8	4.1	4.1	1.5	0.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	122	73	218	131	93
Missing cases	3	5	2	0	0

 Table A2.27b
 View on 'punish offending traders/consumers,' Traditional fishers

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	96.6	80.0	93.8	95.2	98.0
'Disagree' %	3.4	15.0	6.8	2.4	2.0
'No opinion' %	0.0	5.0	0.0	2.4	0.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	30	20	81	42	102
Missing cases	0	1	0	1	0

 Table A2.27c
 View on 'punish offending traders/consumers,' Post-harvest operators

Response	Burundi	DRC	Tz/Kigoma	Tz/Rukwa	Zambia
'Agree' %	95.2	91.5	68.1	74.1	98.2
'Disagree' %	3.2	2.4	17.6	13.8	1.8
'No opinion' %	1.6	6.1	14.3	12.1	0.0
Total %	100.0	100.0	100.0	100.0	100.0
Report cases	62	82	119	58	110
Missing cases	0	0	0	0	0