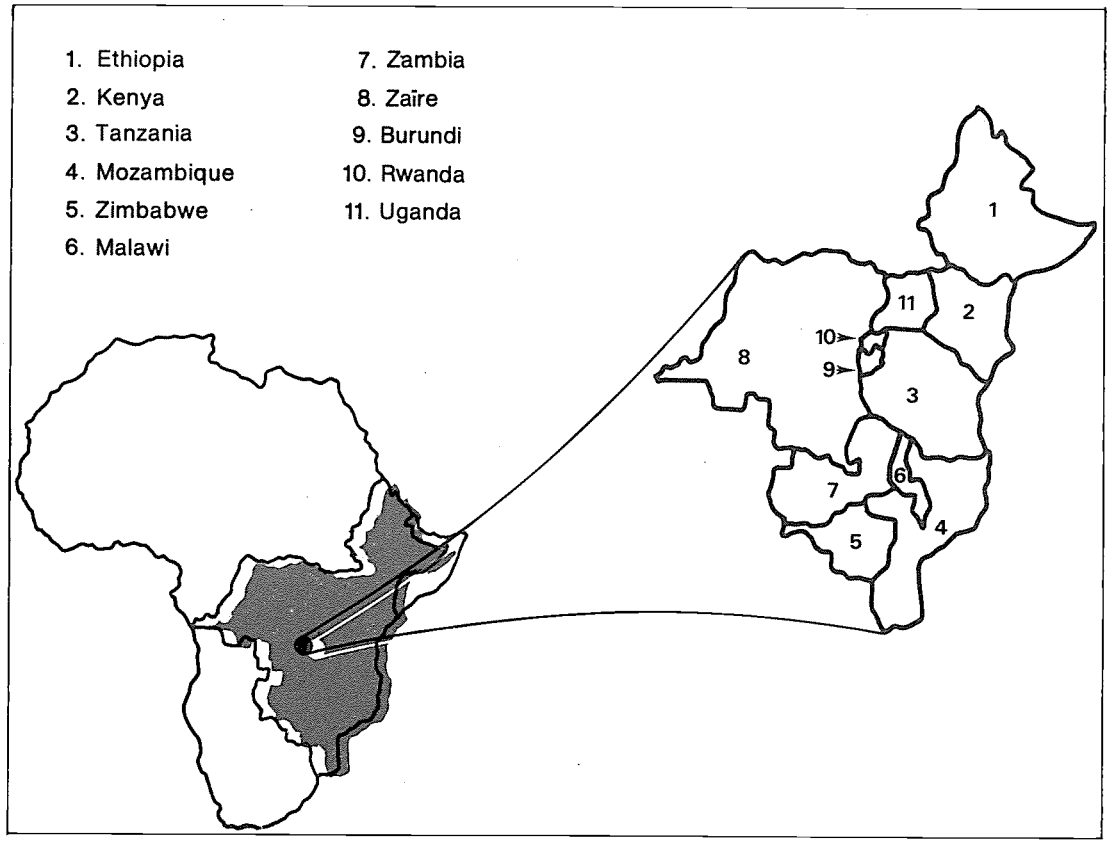
REGIONAL PROJECT FOR INLAND FISHERIES PLANNING, DEVELOPMENT AND MANAGEMENT IN EASTERN/CENTRAL/SOUTHERN AFRICA (I.F.I.P.)

IFIP PROJET

RAF/87/099-TD/16/90 (En) November 1990

REPORT OF THE NATIONAL WORKSHOP ON FISHERY STATISTICS AND INFORMATION SYSTEMS

(22-26 October 1990, Addis Ababa, Ethiopia)



UNITED NATIONS DEVELOPMENT PROGRAMME

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

UNDP/FAO Regional Project
for Inland Fisheries Planning
Development and Management in
Eastern/Central/Southern Africa

RAF/87/099-TD/16/90 (En)

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UNITED NATIONS DEVELOPMENT PROGRAMME
Bujumbura, November 1990

PREFACE

The IFIP project started in January 1989 with the main objective of promoting a more effective and rational exploitation of the fisheries resources of major water bodies of Eastern, Central and Southern Africa. The project is executed by the Food and Agriculture Organization of the United Nations (FAO), and funded by the United Nations Development Programme (UNDP) for a duration of four years.

There are eleven countries and three intergovernmental organizations participating in the project: Burundi, Ethiopia, Kenya, Malawi, Mozambique, Uganda, Rwanda, Tanzania, Zambia, Zaire, Zimbabwe, The Communauté Economique des Pays des Grands Lacs (CEPGL), The Preferential Trade Area for Eastern and Southern African States (PTA) and the Southern African Development Coordination Conference (SADCC).

The immediate objectives of the project are: (i) to strengthen regional collaboration for the rational development and management of inland fisheries, particularly with respect to shared water bodies; (ii) to provide advisory services and assist Governments in sectoral and project planning; (iii) to strengthen technical capabilities through training; and (iv) to establish a regional information database.

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This document is the Report of the National Workshop on Fishery Statistics and Information Systems in Ethiopia. The Workshop was held from October 22 to 26, 1990, at the Fisheries Research and Development Department (FRDD) of the Ministry of Agriculture in Addis Ababa. It was attended by 19 participants from the various administrative and autonomous regions of the country and 2 participants from the central office. The Workshop was sponsored by the Regional Project for Inland Fisheries Planning, Development and Management in Eastern/Central/Southern Africa (IFIP). It was co-organized by FRDD, IFIP and the Fishery Information, Data and Statistics Service (FIDI) of FAO.

The document consists of the report of the workshop and various annexes including list of participants, agenda, detailed programme of discussions and group exercises. A fishing industry simulator was presented during the workshop. This computer programme which was developed by C. Stamatopoulos (FIDI) simulates frame and catch/effort surveys and will be presented in a separate project publication.

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IFIP PUBLICATIONS

Publications of the IFIP project are issued in two series:

A series of technical documents (RAF/87/099-TD) related to meetings, missions and research organized by the project.

A series of working papers (RAF/87/099-WP) related to more specific field and thematic investigations conducted in the framework of the project.

For both series, reference is further made to the document number (16), the year of publication (90) and the language in which the document is issued: English (En) or French (Fr).

For bibliographic purposes this document should be cited as follows:

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1990

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INTRODUCTION

Preamble

This document is the Report of the National Workshop on Fishery Statistics and Information Systems in Ethiopia. The Workshop was held from October 22 to 26, 1990, at the Fisheries Research and Development Department (FRDD) of the Ministry of Agriculture in Addis Ababa.

The workshop was attended by 19 Ethiopian fishery experts from the various administrative and autonomous regions of the country and 2 participants from the central office in Addis Ababa. The Workshop was sponsored by the Regional Project for Inland Fisheries Planning, Development and Management in Eastern/Central/ Southern Africa (IFIP). It was jointly organized by FRDD, IFIP and the Fishery Information, Data and Statistics Service (FIDI) of FAO.

Local support was provided through the Fisheries Research and Development Department and the FAO Representation.

Background and Purpose

The importance of statistics and information system in fishery management and development being recognized, the Government of Ethiopia requested the assistance of IFIP in improving the skills of the fishery officers directly involved in inland fisheries data collection.

In structuring the agenda of the workshop, it was decided to focus on frame, catch/effort and socio-economic surveys. Also, as this was not a training course, main emphasis was put on group exercises dealing when possible with actual data collected by the participants.

A fishing industry simulator was presented during the workshop and installed in the FRDD computer. This computer programme which was developed by C. Stamatopoulos (FIDI) simulates frame and catch/effort surveys and will be presented in a separate project publication.

Report of the Workshop on Fishery Statistics and Information System

(Addis Ababa, 22-26 October 1990)

1 OPENING OF THE WORKSHOP

The meeting was opened by Ms. Mebrat Alem, Head, Fish Culture and Research Division, Ministry of Agriculture. After welcoming the FAO consultants and the participants (Annex 1), she expressed her thanks to the IFIP project for supporting the workshop and to the participants for their very high interest in attending.

She then referred to the need for a well-formulated fishery information system for the inland fisheries in Ethiopia and stressed the present lack of timely and accurate data on catch and effort, which are indispensable for fisheries monitoring and management. She expressed her hope that the workshop would assist in the effort to strengthen the national capability in developing and supporting a modern and workable data collection and processing system, as its objectives are most appropriate and relevant to the critical need of the nation for reliable fisheries data.

The provisional agenda of the workshop was adopted (Annex 2).

2 INTRODUCTION TO FISHERY STATISTICS

Discussion started with a brief history of Fishery Information Systems, by describing their basic methodological and operational features in the period 1965-1980, and the structural changes that occurred in the last ten years. Reference was made to the primary purposes of fishery statistical programmes and the emphasis placed on development and enhancement by the 1984 World Fish Conference and the COFI Sessions thereafter.

The role of microcomputers in the design and implementation of medium and large-scale statistical surveys was examined as well as the impact of computer-based data management techniques on methodological and operational aspects of fishery statistics. The first conclusion of the meeting was that the data processing component ought to be viewed as an integral part of the national statistical system and be built-in in all its phases, from the very lowest such as data collection up to the stage where information is presented and disseminated. Further, the meeting recognized the need for fishery administrations to upgrade and enhance their infrastructure by establishing a National Fishery Data Center capable of providing regular and effective services to producers and users of fishery statistical data.

Regarding statistical aspects the meeting concentrated on issues concerning basic data only, that is catch and fishing effort. It reviewed methodological and operational criteria, based on which major decisions are made as to the

type of survey approach to be selected for the purpose of statistical monitoring of a fishery (census or sample-based surveys). In discussing some general issues of sampling, examples were presented demonstrating the commonest sources of bias and the impact of statistical shortcomings on the derivation of total estimates.

With respect to data processing aspects, the meeting reviewed the minimum requirements essential for developing and supporting a regular, self-sustaining and computer-based fishery information system. A discussion followed highlighting the commonest computer hardware and software tools currently in use by other systems, such as Wordprocessors, Spreadsheets, Database Management and third generation programming languages. The meeting concluded that the number of users wishing to be involved in basic computer functions should not be limited to professional system design and implementation experts, but to include also national experts that would make use of computing tools in their daily office work. It was also concluded that in addition to centrally based computing units, low configuration data processing tools would be highly desirable on a decentralized basis. It was felt that personal microcomputers should be seen as essential office equipment, given their declining cost and proven role in increasing staff efficiency. A final conclusion was that under the assumption that an adequate infrastructure would exist to cater for the many and complex problems relating to the introduction of a regular statistical programme, then a certain amount of external technical assistance would be required, in order to assist in solving operational and logistical problems (vehicles, computer equipment and software, office equipment, etc.), as well as to ensure a long-term and self-sustaining statistical programme by means of systematic training and upgrading of national skills in both statistical and computing applications sectors.

3 FRAME SURVEYS

The participants were introduced to the principles of static and dynamic inventories of data resulting from frame surveys. Examples were presented illustrating different methods for stratification according to administrative, operational and methodological criteria. The presentation continued with examples of codification schemes used to describe landing sites and their geographical as well as statistical placement in hierarchical tables. Examples of frame survey questionnaires were distributed and discussed in terms of structure, contents, coverage, purpose and seasonal variability.

Three exercises were worked out. The first involved all participants as one group and dealt with proportional sampling. Twenty fictional landing sites were grouped in clusters using as criterion the presence of fishing gear and the availability of recorders for sampling at landing sites.

The meeting was then divided into four groups in order to work out the first group exercise concerning the derivation of summary information from interviews and sample catch/effort records. During this exercise and in the next three, the groups worked on simulated data generated by a simulator program especially designed for training and design purposes. The exercise involved the derivation, on a landing site basis, of boat summaries by boat and gear types, fishing and landing patterns, and likely ranges of catches by species for each boat day. Prices were also involved in the derivation of these summaries.

The second group exercise was a continuation of the first and involved the computation of total catches, fishing effort and expected monthly sales, by strictly using inventory data.

Taking the opportunity of the workshop and the interest of the participants, Dr. F.A. Sibbing (Agricultural University Wageningen, The Netherlands) presented a seminar on "Mechanisms of intra-oral food processing in cyprinid fish and its implications for fisheries". Due to time constraints, he agreed to present it after the discussion on frame surveys. A summary of his contribution follows:

The anatomic structure, physiology and feeding behaviour of fish (for example, search, pursuit intake, selection on taste and size, mastication, digestion) have evolved as a specialization for effective processing of specific aquatic food types (e.g. plankton, benthos, fish, maerophytes). The study on Lake Tana Barbus aims to compile a practical practical key to be used by fishermen to distinguish between the many different ecological types of Barbus. The objective is to reconstruct the fish-food intersections (foodweb) in Lake Tana which will enable an accurate prediction of the consequence of inbalances, either due to human (fishermen) exploitation or environmental changes on the fish stock. Management measures will then allow rational and lasting exploitation of the food resources of the Lake for the future.

4 CATCH/EFFORT ASSESSMENT SURVEYS

Discussion started with a classification of information sources into primary: those closest to production and fishing activities (such as catch/effort survey forms, landing forms, logbooks), secondary and tertiary sources (such as markets records, purchase slips and trade records). Thereafter presentations and discussions focused on surveys conducted at landing sites. It was generally felt that complete enumeration approaches (census) would be impractical and costly, even for a moderate number of fishing activities. However, it was concluded that limited census techniques would be very useful if conducted at distant intervals for cross-checking purposes (mini-census). Further, the meeting examined the importance of adequately designed data collection forms that would facilitate recording of the data on the part of enumerators and, at the same time, be the source document for entering the information into computer files. In this connection it was concluded that the implementation of a survey programme would necessitate adequate and sufficient logistical support, at present not available.

In discussing statistical scenarios as alternative solutions to data collection problems, the meeting stressed the need for accurate information relating to fishing and landing patterns, which would greatly assist the preparation of work schedules for the data collectors. It further considered the need for exercising regular supervision over the activities of recorders in order to offer guidance and advice and also ensure that the data collection work is performed properly.

Some basic statistical principles were discussed regarding sample and population means, sample and population variance, sampling errors and bias. The importance of adequate archiving systems for past primary catch/effort data was also stressed, as this allows back reference to old data collections,

whenever a need for re-estimating using different raising factors should arise.

The meeting discussed several methods for recording fishing effort. Generally, it was concluded that sample data should contain as much information as possible regarding fishing effort which would thus include trips (boat days), duration of fishing (in hours), number of fishermen involved, number of net sets, number of gear units employed, etc. It was concluded, however, that for the purposes of obtaining specific information, for example, total effort exerted over a reference period, then only the number of trips (boat days), would be necessary and reasonably easy to enumerate on a daily basis for all landing sites.

EVALUATION OF STATISTICAL SCENARIOS

The major part of the presentations and discussions regarding catch/effort assessment surveys, was dedicated to the explanation of the underlying concepts in each sampling strategy. Theory was followed by group exercises 3,4 and 5 for testing alternative statistical scenarios applied to simulated catch/effort data (exercises 3 and 4) and actual data collected for lake Awassa (exercise 5).

Scenario 1 concerns sampling surveys based on a complete enumeration of all boats active on selected sampling days, and using the gear used as a statistical unit. Sample CPUE is computed by dividing the sample catch by the number of gear units employed in the sample. Further, an estimated total effort in number of gear units employed by all boats over the reference period is computed by multiplying the sample gear by the total number of days divided by the number of sample days.

Scenario 2 is based on the same principles as 1, only that the statistical unit is the trip. Thus the sample CPUE is expressed as sample catch per number of sample trips. An estimate of the total effort in trips is derived from the sample trips using the same raising factor as in 1, that is total days divided by sample days.

Scenarios 1 and 2 are characterized by census in space (since all boats must be covered on a sampling day), and sampling in time (because boat enumeration occurs only on a limited number of days selected at random). The meeting observed that these techniques would present operational difficulties at landing sites with large numbers of boats, since the method would have to be adjusted (by dropping missed boats from the calculation of the sample CPUE but including the unsampled trips in the raising factor), if for some reason not all of the boats could have been traced. However it was recognized that these two techniques offer the advantage that no frame data or any other survey are required, as all estimates can be derived from the sample.

Scenario 3 consists of sampling random fishing gear at any landing site and on any day. Thus, the sample CPUE can be formulated as sample catch divided by number of gear employed by the sample. Since no estimate of the total effort is feasible, the method assumes that the actual total use of gear will become known by a parallel and independent census on effort. Although this scenario offers simplicity in the calculation of estimates and is also statistically robust, it nevertheless presents certain operational difficulties for enumerating total effort expressed in gear. The meeting felt

that frame data would be indicative only, as the employment of gears by the same boat can be highly variable over a month.

Scenario 4 is similar to 3, only that the statistical unit is the trip (boat day). The sample CPUE is formulated as sample catch per number of trips in the sample. Since no estimate of the total effort in trips can be derived from the sample, the method assumes that all trips at landing sites can be derived by a parallel and independent census. The meeting observed that this approach would be operationally feasible for landing sites that are sufficiently covered by fishery officers and assistants.

Scenarios 3 and 4 are cases where the survey is based on sampling in space (recording of gear or trips at random over a survey period), and census in time (complete enumeration of effort, whether in gear used or trips made).

Scenario 5 considers the boat as the statistical unit. Preselected boats (at random) are systematically traced over a number of sample days, also selected randomly. All preselected boats are recorded on the designated sample days, including zero activities. An estimate of the total catch can be derived using two raising factors: one for the boats (total number of boats at the site divided by the number of preselected boats), and one for the days (length of the survey period divided by the number of sample days).

Several experiments with simulated and actual data revealed that this method (based on sampling in both space and time), is the least accurate of the other four; an expected conclusion given that two assumptions of uniformity are used, rather than one. However, the experiments indicated that sample sizes of 15% and above tend to provide quite acceptable results, at least within the scope of the data used.

In continuing the discussions concerning the results of group exercise 5 which consisted of applying all five scenarios on actual data for lake Awassa, the meeting was presented with computer software for the simulation and analysis of catch/effort data. The demonstration continued with some experiments of the impact of sample size on the accuracy of the resulting estimates. The following table summarizes the findings:

TABLE DEMONSTRATING IMPACT OF SAMPLE SIZE

ON THE ACCURACY OF THE ESTIMATES

(22 days - 28 boats)

(Use was made of catch/effort data for lake Awassa kindly made available by the Fisheries Department)

Catch (kgs)	TILAPIA	CATFISH	BARBUS
Actual catch:	16,652	1,958	730
Scenario 3	18,648	816	175
Scenario 4	20,463	895	192
Sample size 5%			
Scenario 3	15,403	1,281	517
Scenario 4	16,367	1,361	550
Sample size 10%			
Scenario 3	16,898	2,093	784
Scenario 4	16,869	2,089	783
Sample size 15%			
Scenario 3	16,702	1,934	722
Scenario 4	16,708	1,947	721
Sample size 20%			

Exercise based on daily catch from Lake Awassa

(data collected during 22 days (25/9/90 - 19/10/90))

Catch (kgs)	Tilapia	Catfish	Barbus
Actual data	**16,652**	**1,958**	**730**
Estimates			
Scenario 1 (10%)	17,570	1,905	771
Scenario 2 (10%)	17,570	1,905	771
Scenario 3 (10%)	16,044	1,110	460
Scenario 3 (15%)	16,152	2,520	733
Scenario 4 (10%)	16,121	1,116	463
Scenario 4 (15%)	15,900	2,481	722
Scenario 5 (4 days)	24,068	1,370	633
Scenario 5 (8 days)	19,657	1,279	1,017

Note: Some differences in the results between the two tables are due to randomization that took place at different instances.

5 BASELINE SURVEYS

The last session of the workshop introduced the participants to the importance of data derived from baseline surveys as a part of the fishery information system, which should not be confined to biological data.

Discussion started by defining the term "baseline survey". "Baseline" could be defined as "a set of indicators/parameters related to demography, social welfare, economy and environment, assessed at a specific moment in time against which future changes may be measured".

Better knowledge of the socio-economic situation of the small-scale fisherman has become essential to fishery management and development planning. However, there is very little information available, even though ever more efficient methods of collecting data on catch and fishing effort are now being used.

Some practical examples of socio-economic information which would be very useful in the context of Ethiopian inland fisheries management and development were discussed.

Without entering into detailed methodological considerations, it was explained that baseline surveys should be conducted in a very short period of time and replicated after 3-5 years to assess the evolution of the sector.

In general, preference should be given to formal interviews with the use of a structured questionnaire. This procedure allows standardisation of the responses and to speed up data processing and analysis.

The participants were then divided into four groups to analyze, discuss and try to adapt to the Ethiopian situation a survey form on socio-economic information designed for Malawi.

A discussion followed which focused on the expected results from baseline surveys and the justification of the questions included in the survey forms. The participants also related the case study to their own experience and the socio-economic dissimilarities among the inland water bodies of Ethiopia.

The meeting concluded that almost no information was available for management and development decisions on the socio-economic situation of small-scale fishermen in Ethiopia and that there was a specific need to start collecting this kind of information as part of the global fishery information system, and to use it in the framework of fishery development and management activities.

The meeting also concluded that, due to the amount of information to be collected during a baseline survey, computer equipment would be necessary to process and analyze the data generated by these surveys.

ANNEX 1

List of Participants

Name	Administrative/ autonomous region	Title
FAO		
C. Stamatopoulos	FAO/Rome Italy	Senior Fisheries Data Officer, FIDI
B. Horemans	IFIP/Bujumbura Burundi	Fisheries Economist
FRDD		
Mebrat Alem	Addis Ababa	Head, Fish Culture & Research Division
Tesfaye Wudneh	Addis Ababa	Research Leader, Lake Tana Fisheries Research Programme
Wubishet Getahun	Gambella	Senior Fishery Expert
Meseret Gudetta	Sidamo	Fishery expert
Birenesh Abay	Sidamo	" "
Tewodras Nega	Western Gojjam	" "
Yussuf Abegaz	South Wollo	" "
Areaya Tilahun	Eastern Shoa	" "
Getachew Fikre	Arssi	" "
Getenet Kassahun	Western Gojjam	" "
Tadesse Guta	Sidamo	" "
Haileslassie Weres	South Gondar	" "
Solomon Tamrat	North Gondar	" "
Meseret Taye	South Shoa	" "
Emiru Endale	South Shoa	" "
Berhanu Zemene	Illubabor	" "
Habtegebriel Teferi	Assab	" "

Name	Administrative/ autonomous region	Title
Sisay Abebe	Sidamo	Fishery Expert
Molla Gudeta	Semen Omo	" "
Mesfin Andargie	Wollega	" "
Aklilu Ayele	Eastern Shoa	" "

ANNEX 2

Agenda of the Workshop

Monday 22	9:00- 9:30	Opening of the workshop
	10:00-12:00	Introduction to Fishery Statistics
	13:00-14:30	Frame survey
	14:45-16:00	Frame survey (cont'd)
Tuesday 23	8:30-10:00	Frame survey (cont'd)
	10:15-12:00	Group exercise
	13:00-14:30	Discussion
	14:45-16:00	Discussion (cont'd)
Wednesday 24	8:30-10:00	Catch and effort survey
	10:15-12:00	Catch and effort survey (cont'd)
	13:00-14:30	Catch and effort survey (cont'd)
	14:45-16:00	Catch and effort survey (cont'd)
Thursday 25	8:30-10:00	Group exercise
	10:15-12:00	Group exercise
	13:00-14:30	Discussion
	14:45-16:00	Discussion
Friday 26	8:30-10:00	Baseline survey: case study
	10:15-12:00	Group exercise and discussion
	14:30	Adoption of the report

ANNEX 3

Detailed Programme of Discussions

NATIONAL WORKSHOP ON DATA COLLECTION - Detailed Programme of Discussions

Addis Ababa 22-26 October 1990 Fisheries Department

ITEM	Item Description	Discussed? Y/N	Officer
	MONDAY 22 OCTOBER		
	MORNING 9:00 - 12:00		
1	OPENING		
	Opening speech by Ms. Mebrat Alem		
	Brief description of the Workshop (Catch/Effort)	Y	Stamatopoulos
	(Socio-Economic)	Y	Horemans
2	INTRODUCTION TO FISHERY STATISTICS		
	Need for. World Fish Conference and COFI Sessions.	Y	Stamatopoulos
	Brief history. Existing Methodology. The impact of	Y	Horemans
	microcomputers. Integrated Fishery Information Sys-		
	tems. The Self-Sustaining Concept. Training aspects	Y	Participants
	Operational aspects. Infrastructure aspects. The concept of Fishery Data Centers.		
	STATISTICAL ASPECTS: Surveying basic data (catch/	Y	Stamatopoulos
	effort). Complete enumeration techniques. Sampling	Y	Horemans
	techniques. Problems of coverage. Problems of bias.		
	Operational and logistical problems. Analytical	Y	Participants
	models based on catch and effort only.		
	DATA PROCESSING ASPECTS: Need for data handling	Y	Stamatopoulos
	tools and methods. Commonest software tools:	Y	Horemans
	WORD PROCESSORS, SPREADSHEETS, DATABASE MANAGEMENT,		
	PROGRAMMING LANGUAGES, INTEGRATION OF APPLICATIONS.	Y	Participants
	Data processing in Data Collection, Storage, Proce-		
	ssing and Presentation of basic data. Data Process-		
	ing in modeling and simulation techniques.		
	AFTERNOON 13:00 - 16:00		
3	FRAME SURVEYS		
	Purpose. Seasonality. Dynamic and Static Inventory.	Y	Stamatopoulos
	Stratification based on administrative and opera-	Y	Horemans
	tional criteria. Stratification based on statisti-		
	cal criteria. Water bodies, strata, minor strata	Y	Participants
	and landing sites. Codification schemes.		
	Distribution of a frame survey form for simulated	Y	Stamatopoulos
	fishery data. Description of data fields. Operatio-	Y	Participants
	nal aspects: Attitudes of fishermen and interview-		
	ers, fiscal means for obtaining data. Rough esti-		
	mates resulting from frame data.		

NATIONAL WORKSHOP ON DATA COLLECTION - Detailed Programme of Discussions

Addis Ababa 22-26 October 1990 Fisheries Department

ITEM	Item Description	Discussed? Y	Discussed? N	Officer
	TUESDAY 23 OCTOBER			
	MORNING 8:30 - 12:00			
3	FRAME SURVEYS (Continued)			
	Summary of earlier topics and discussion	Y		Stamatopoulos
		Y		Horemans
	Species identification problems and approaches	Y		Sibbing
		Y		Participants
	GROUP EXERCISE 1 using the Simulator	Y		Stamatopoulos
		Y		Participants
	AFTERNOON 13:00 - 16:00			
	GROUP EXERCISE 2	Y		Stamatopoulos
	Discussion	Y		Participants
	WEDNESDAY 24 OCTOBER			
	MORNING 8:30 - 12:00			
4	CATCH/EFFORT ASSESSMENT SURVEYS			
	Primary and Secondary Information Sources. Landing sites, markets, landing forms, logbooks, purchase forms.	Y		Stamatopoulos
		Y		Horemans
		Y		Participants
	Coverage of landing sites. Census and sampling. Statistical scenarios. Fishing and landing patterns in assisting sampling tactics. Equipment for recorders. Supervision. Cross-checking methods. Mini-census.			
	Basic statistical concepts. Population and sample means. Population and sample variance. Sampling error. Sources of bias. De-biasing techniques. Coefficient of variation. Practical approximations.			
	Catches and CPUE according to statistical units. Impact of operational and logistical constraints to the selection of statistical units. Computation of sample CPUE's. Estimation of total catches			
	AFTERNOON 13:00 - 16:00			
	Census in space and sampling in time using gear units as statistical unit. GROUP EXERCISE 3	Y		Stamatopoulos
		Y		Participants

NATIONAL WORKSHOP ON DATA COLLECTION - Detailed Programme of Discussions

Addis Ababa 22-26 October 1990 Fisheries Department Page 3

ITEM	Item Description	Discussed? Y	Discussed? N	Officer
	THURSDAY 25 OCTOBER			
	MORNING 8:30 - 12:00			
3	CATCH/EFFORT ASSESSMENT SURVEYS (Continued)			
	Summary of earlier topics and discussion.	Y		Stamatopoulos
		Y		Horemans
		Y		Participants
	Census in space and sampling in time using the fishing day as statistical unit. GROUP EXERCISE 4. Discussion.	Y		Stamatopoulos
		Y		Participants
	AFTERNOON 13:00 - 16:00			
	Sampling in space and census in time using the gear used as statistical unit. GROUP EXERCISE 5. Discussion.	Y		Stamatopoulos
		Y		Participants
	FRIDAY 26 OCTOBER			
	MORNING 8:30 - 12:00			
5	BASELINE SURVEY: A case study	Y		Horemans
		Y		Participants
	GROUP EXERCISE 6.			
	AFTERNOON 14:00 - 16:00			
6	ADOPTION OF THE REPORT	Y		

ANNEX 4

Catch/effort Data Collection Forms

and Group Exercises

INVENTORY OF FISHERY INFORMATION AS OF ▒▒.▒▒.19▒▒ (Day.Month.Year)

Recorder: _____ Day of the week: ▒▒ (1=Monday)

A. Geographical Coverage

Water Body....Code: ▒▒▒▒ Description: _____

Stratum..... ▒▒▒▒ _____

Landing site.. ▒▒▒▒ _____

B. Inventory of gear and boats

Boat type.....Code: ▒▒▒▒ Description: _____ No.units: ▒▒▒▒

Gear type..... ▒▒▒▒ _____ ▒▒▒▒

Using information from Catch/Effort forms, the following data should also be specified here (average figures):

Number of boats that went out fishing today .....▒▒▒▒

Number of gear that was used for fishing today.....▒▒▒▒

C. Information on catches

Species Code	Description	Minimum kg/day	Min. price per kg	Maximum kg/day	Max. price per kg
1. ▒▒▒▒	_____	_____	_____	_____	_____
2. ▒▒▒▒	_____	_____	_____	_____	_____
3. ▒▒▒▒	_____	_____	_____	_____	_____
4. ▒▒▒▒	_____	_____	_____	_____	_____
5. ▒▒▒▒	_____	_____	_____	_____	_____
6. ▒▒▒▒	_____	_____	_____	_____	_____

As in the case of boat and gear activity, the above data will be derived from figures of the catch/effort data.

D. Fishing and landing patterns (from catch forms)

Minimum no. of fishing days in a month: ▒▒ Maximum: ▒▒

Percentage of boats fishing on: SATURDAYS: ▒▒ % on: SUNDAYS: ▒▒ %

Time trip starts.....Earliest: ▒▒:▒▒ Latest : ▒▒:▒▒

Landing time..... ▒▒:▒▒ :▒▒:▒▒

Hours fishing.....Minimum: ▒▒ Maximum: ▒▒

NATIONAL WORKSHOP ON DATA COLLECTION - GROUP EXERCISE 1 - FRAME SURVEYS

Addis Ababa 22-26 October 1990 Fisheries Department Page 1

This group exercise concerns the derivation of summaries for fishing activities over a period of 31 days. In this example the month of October 1990 was chosen to describe a full month of fishing activities.

Complete information has been made available for Fishing Site 3 belonging to Stratum 1 of Lake 1. Next page contains details of fishing activities of several boats landing at this Site. There are 52 records each of which contains the following information:

BONUM: This number identifies a boat. Boats 13,14,15,16,17,18 are included in this survey.

BOTYPE: Type of boat. There are 2 types in the fishery: 1 and 2.

BOGEAR: Type of gear. There are 2 types in the fishery: 1 and 2

BOSITE: Site code. There are 12 sites in the fishery (1-12). Since we are dealing with Site 3 only, all records contain the same no.(3)

BODAY: Day of the month, for instance 9, meaning 9.10.1990.

BOWDAY: Day of the week, 1-7, 1=Monday, 2=Tusday, etc.... 7=Sunday.

BOGEARUN: Indicates number of gear units used by a boat during each fishing trip.

BOSTART: Time trip started. All times are rounded to integer hours.

BOLAND: Time of landing.

BOFISH: Number of hours fishing during that particular day.

Using these records the participants are invited to derive the following summary information:

	Boat type 1 - Gear type 1		Boat type 2 - Gear type 2	
No. of boats.....:	____		____	
No. of gear units:	____		____	
Total trips made.:	____		____	
No. of fishermen.:	____		____	
	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM
No. of trips.....:	_____	_____	_____	_____
Start time.....:	_____	_____	_____	_____
Landing time.....:	_____	_____	_____	_____
Hours fishing....:	_____	_____	_____	_____

NOTE: In deriving MINIMA select minimum value for each boat and compute the average over the number of boats. This will be the MINIMUM for the Site. The same approach should be used for MAXIMA.

Record#	BONUM	BOTYPE	BOGEAR	BOSITE	BODAY	BOWDAY	BOGEARUN	BOSTART	BOLAND	BOFISH
1	13	1	1	3	9	2	2	7	13	2
2	13	1	1	3	30	2	2	7	18	3
3	13	1	1	3	19	5	2	4	16	3
4	13	1	1	3	7	7	2	4	17	2
5	13	1	1	3	18	4	2	4	13	5
6	13	1	1	3	31	3	2	8	18	5
7	13	1	1	3	1	1	2	8	14	3
8	13	1	1	3	16	2	2	6	14	3
9	13	1	1	3	22	1	2	4	16	2
10	13	1	1	3	15	1	2	8	13	2
11	13	1	1	3	6	6	2	7	12	3
12	13	1	1	3	25	4	2	6	17	5
13	13	1	1	3	11	4	2	4	16	5
14	14	2	1	3	29	1	7	4	13	5
15	14	2	1	3	12	5	7	3	14	5
16	14	2	1	3	4	4	7	3	11	6
17	14	2	1	3	9	2	7	5	11	6
18	15	2	1	3	15	1	6	4	15	6
19	15	2	1	3	8	1	6	5	15	6
20	15	2	1	3	17	3	6	3	10	6
21	15	2	1	3	10	3	6	3	11	5
22	15	2	1	3	1	1	6	3	15	6
23	15	2	1	3	3	3	6	3	14	5
24	16	2	1	3	22	1	2	5	13	6
25	16	2	1	3	30	2	2	5	14	6
26	16	2	1	3	1	1	2	4	10	6
27	16	2	1	3	5	5	2	3	15	6
28	16	2	1	3	24	3	2	5	14	5
29	16	2	1	3	29	1	2	4	12	5
30	16	2	1	3	11	4	2	3	11	5
31	16	2	1	3	23	2	2	3	13	6
32	16	2	1	3	8	1	2	5	12	5
33	17	2	2	3	12	5	2	6	15	5
34	17	2	2	3	5	5	2	5	14	5
35	17	2	2	3	29	1	2	5	15	3
36	17	2	2	3	30	2	2	5	15	5
37	17	2	2	3	11	4	2	7	15	4
38	17	2	2	3	26	5	2	6	14	4
39	17	2	2	3	24	3	2	4	15	5
40	17	2	2	3	19	5	2	4	14	4
41	17	2	2	3	22	1	2	7	14	4
42	17	2	2	3	3	3	2	5	15	4
43	17	2	2	3	4	4	2	7	15	3
44	18	2	2	3	4	4	1	5	15	3
45	18	2	2	3	23	2	1	7	14	3
46	18	2	2	3	2	2	1	5	14	4
47	18	2	2	3	25	4	1	4	15	3
48	18	2	2	3	16	2	1	7	14	3
49	18	2	2	3	24	3	1	6	15	4
50	18	2	2	3	11	4	1	4	15	5
51	18	2	2	3	3	3	1	8	15	3
52	18	2	2	3	1	1	1	7	15	3

SIMULATION OF FRAME AND CATCH/EFFORT SURVEYS - FRAME REPORT BY SITE

Please specify.....Site: 3 Boat type: 1 Gear type: 1 (0 to EXIT)

Site 3
Boat type 1 LONGLINE

AVER in trips means (FISHING trips/ NO. BOATS)

Number of boats.....	1					
Number of gear units.....	2					
Total trips	13	Minimum	13	Maximum:	13	Aver: 13.0
Total no. fishermen.....	1		1		1	1.0
Starting times.....			4.0		8.0	6.0
Landing times.....			12.0		18.0	15.0
Hours/day fishing.....			2.0		5.0	3.5

Catch ranges - Species 1:	6.0	14.0	10.0	Prices:	5.0	7.0	6.0
Catch ranges - Species 2:	0.0	0.0	0.0	Prices:	0.0	0.0	0.0
Catch ranges - Species 3:	0.0	0.0	0.0	Prices:	0.0	0.0	0.0
Catch ranges - Species 4:	0.0	0.0	0.0	Prices:	0.0	0.0	0.0
Catch ranges - Species 5:	0.0	0.0	0.0	Prices:	0.0	0.0	0.0
Catch ranges - Species 6:	0.0	0.0	0.0	Prices:	0.0	0.0	0.0

SIMULATION OF FRAME AND CATCH/EFFORT SURVEYS - FRAME REPORT BY SITE

Please specify.....Site: 3 Boat type: 2 Gear type: 1 (0 to EXIT)

Site 3
Boat type 2 LONGLINE

AVER in trips means (FISHING trips/ NO. BOATS)

Number of boats.....	3					
Number of gear units.....	15					
Total trips	19	Minimum	4	Maximum:	9	Aver: 6.3
Total no. fishermen.....	3		1		1	1.0
Starting times.....			3.0		5.0	4.0
Landing times.....			10.3		14.6	12.5
Hours/day fishing.....			5.0		6.0	5.5

Catch ranges - Species 1:	0.0	0.0	0.0	Prices:	0.0	0.0	0.0
Catch ranges - Species 2:	0.0	0.0	0.0	Prices:	0.0	0.0	0.0
Catch ranges - Species 3:	0.0	0.0	0.0	Prices:	0.0	0.0	0.0
Catch ranges - Species 4:	17.0	26.3	21.6	Prices:	6.3	7.6	7.0
Catch ranges - Species 5:	5.0	8.3	6.6	Prices:	6.0	7.0	6.5
Catch ranges - Species 6:	0.0	0.0	0.0	Prices:	0.0	0.0	0.0

NATIONAL WORKSHOP ON DATA COLLECTION - GROUP EXERCISE 2 - FRAME SURVEYS

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This a continuation of exercise 1 and concerns catches and prices. The fishery comprises 6 species (1-6) the catches of which are denoted by BOC1, BOC2, BOC3, BOC4, BOC5, and BOC6 respectively. The prices are denoted by BOP1, ... ,BOP6.

Next page contains catch and price data for each of the 52 records studied in the previous exercise. Participants must align this sheet with the former one in order to identify the boats catching these quantities. To be noticed that boats and gear of the (1,1) type catch only SPECIES 1, whereas the (2,1) types catch SPECIES 4 and SPECIES 5.

The following question must first be answered concerning Site 3:

	Boat type 1 - Gear type 1		Boat type 2 - Gear type 1		
	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM	
Catches of SPECIES 1: (per boat)	_____	_____	_____	_____	SPECIES 4
			_____	_____	SPECIES 5
Prices of SPECIES 1:	_____	_____	_____	_____	SPECIES 4
			_____	_____	SPECIES 5

For MINIMA and MAXIMA the same technique as in Exercise 1 will be used, that is first identifying extreme values for each boat and then computing the average over the number of boats. Last page of Exercise 1 also contains results for catches and prices, so as to facilitate confirmation of the approach used.

Based on the results of Exercise 1 and the data obtained from the above approach, participants are now invited to answer the following questions:

1. Assuming minimum effort in trips, minimum catches and minimum prices what should be the expected catches and values of landings?

   SPECIES 1..... Total catch: _____ Total value: _____

   SPECIES 4..... Total catch: _____ Total value: _____

   SPECIES 5..... Total catch: _____ Total value: _____

2. Assuming MAXIMA for trips, catches and prices indicate:

   SPECIES 1..... Total catch: _____ Total value: _____

   SPECIES 4..... Total catch: _____ Total value: _____

   SPECIES 5..... Total catch: _____ Total value: _____

NOTE: Compute first minimum and maximum TOTAL EFFORT in TRIPS.
Some small differences in the results are due to rounding errors.

Record#	80C1	80P1	B0C2	B0P2	B0C3	80P3	80C4	B0P4	B0C5	80P5	B0C6	B0P6
1	9	5	0	0	0	0	0	0	0	0	0	0
2	9	6	0	0	0	0	0	0	0	0	0	0
3	6	5	0	0	0	0	0	0	0	0	0	0
4	14	5	0	0	0	0	0	0	0	0	0	0
5	8	5	0	0	0	0	0	0	0	0	0	0
6	8	5	0	0	0	0	0	0	0	0	0	0
7	12	7	0	0	0	0	0	0	0	0	0	0
8	7	5	0	0	0	0	0	0	0	0	0	0
9	8	7	0	0	0	0	0	0	0	0	0	0
10	10	6	0	0	0	0	0	0	0	0	0	0
11	11	7	0	0	0	0	0	0	0	0	0	0
12	13	6	0	0	0	0	0	0	0	0	0	0
13	11	6	0	0	0	0	0	0	0	0	0	0
14	0	6	0	11	0	4	24	8	6	6	0	0
15	0	6	0	11	0	5	23	8	6	7	0	0
16	0	5	0	13	0	5	25	7	7	7	0	0
17	0	7	0	11	0	5	17	7	5	6	0	0
18	0	5	0	14	0	5	27	6	7	7	0	0
19	0	6	0	11	0	5	27	6	8	6	0	0
20	0	6	0	10	0	4	23	7	5	6	0	0
21	0	5	0	13	0	4	27	6	5	7	0	0
22	0	7	0	13	0	4	17	6	9	7	0	0
23	0	6	0	12	0	4	15	6	5	6	0	0
24	0	7	0	12	0	4	24	6	6	6	0	0
25	0	7	0	14	0	5	19	7	8	6	0	0
26	0	7	0	12	0	5	24	7	8	7	0	0
27	0	6	0	14	0	5	23	7	6	7	0	0
28	0	7	0	11	0	4	27	6	5	7	0	0
29	0	6	0	14	0	4	27	8	5	6	0	0
30	0	5	0	14	0	5	20	6	8	6	0	0
31	0	6	0	11	0	5	22	8	9	7	0	0
32	0	6	0	11	0	5	20	6	9	7	0	0
33	0	7	0	14	0	4	0	7	0	7	11	3
34	0	7	0	12	0	5	0	6	0	6	11	3
35	0	7	0	13	0	5	0	7	0	6	10	3
36	0	5	0	11	0	5	0	7	0	6	16	2
37	0	7	0	13	0	4	0	7	0	6	17	3
38	0	6	0	10	0	5	0	8	0	6	16	3
39	0	7	0	10	0	4	0	6	0	7	10	2
40	0	6	0	12	0	4	0	6	0	6	17	3
41	0	7	0	13	0	4	0	8	0	6	17	2
42	0	5	0	14	0	4	0	8	0	6	18	2
43	0	6	0	14	0	4	0	7	0	6	17	2
44	0	7	0	14	0	5	0	7	0	6	11	2
45	0	5	0	10	0	5	0	8	0	6	13	3
46	0	5	0	13	0	4	0	7	0	6	18	3
47	0	5	0	12	0	4	0	7	0	7	16	3
48	0	6	0	13	0	5	0	6	0	7	14	3
49	0	7	0	12	0	5	0	8	0	7	17	2
50	0	7	0	12	0	4	0	8	0	6	12	3
51	0	5	0	13	0	4	0	8	0	6	16	2
52	0	7	0	13	0	4	0	8	0	6	14	3

SIMULATION OF FRAME AND CATCH/EFFORT SURVEYS - EXPECTED CATCHES BY SITE

Please specify a site by its number...: 3
Boat type: 1 Gear type: 1 (0 to EXIT)

Boat type 1	LONGLINE			AVER in trips means (FISHING trips/ NO. BOATS)			
Number of boats.....	1						
Number of gear units.....	2						
Total trips	13	Minimum	13	Maximum:	13	Aver:	13.0
Total no. fishermen.....	1		1		1		1.0
Starting times.....			4.0		8.0		6.0
Landing times.....			12.0		18.0		15.0
Hours/day fishing.....			2.0		5.0		3.5
Catch ranges - Species 1:	78	182	130	Prices:	390	1274	780
Catch ranges - Species 2:	0	0	0	Prices:	0	0	0
Catch ranges - Species 3:	0	0	0	Prices:	0	0	0
Catch ranges - Species 4:	0	0	0	Prices:	0	0	0
Catch ranges - Species 5:	0	0	0	Prices:	0	0	0
Catch ranges - Species 6:	0	0	0	Prices:	0	0	0

SIMULATION OF FRAME AND CATCH/EFFORT SURVEYS - EXPECTED CATCHES BY SITE

Please specify a site by its number...: 3
Boat type: 2 Gear type: 1 (0 to EXIT)

Boat type 2	LONGLINE			AVER in trips means (FISHING trips/ NO. BOATS)			
Number of boats.....	3						
Number of gear units.....	15						
Total trips	19	Minimum	4	Maximum:	9	Aver:	6.3
Total no. fishermen.....	3		1		1		1.0
Starting times.....			3.0		5.0		4.0
Landing times.....			10.3		14.6		12.5
Hours/day fishing.....			5.0		6.0		5.5
Catch ranges - Species 1:	0	0	0	Prices:	0	0	0
Catch ranges - Species 2:	0	0	0	Prices:	0	0	0
Catch ranges - Species 3:	0	0	0	Prices:	0	0	0
Catch ranges - Species 4:	204	711	457	Prices:	1292	5451	3202
Catch ranges - Species 5:	60	225	142	Prices:	360	1575	926
Catch ranges - Species 6:	0	0	0	Prices:	0	0	0

NATIONAL WORKSHOP ON DATA COLLECTION - GROUP EXERCISE 3 - CATCH/EFFORT

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The purpose of this exercise is to derive estimates of total catches of SPECIES 1, caught by all boats of BOAT TYPE 1 and GEAR TYPE 1 from ALL sites 1-12.

In order to do this ALL fishing sites were covered by recorders during the days of October: 2,4,10,13 (a Saturday),18,24, and 30, for a total of 7 sampling days. During each sampling day ALL boats were recorded.

Next page contains a list of the data collected.

BONUM..... Boat identification number
BOSITE..... Landing Site
BODAY..... Day of the month
BOWDAY..... Day of the week, 1=Monday, ... , 7=Sunday
BOGEARUN..... Number of gear units used by a boat
BOC1..... Catches of SPECIES 1 in KG

The boat and gear types are not shown, as they are all of the 1,1 type.

The first approach to be used is to consider the fishing gear as the statistical unit. Thus the sample CPUE will be expressed as:

CPUE = (Total sample catch / Total sample gears)

Compute total catch by adding the BOC1 column (1) _____ KGS
Compute gear units used by adding BOGEARUN (2) _____ GEARS

CPUE in KG/GEARS = (1)/(2) = (3) _____ KG/GEAR

Next step concerns the estimation of total effort in gear units used. This is expressed as:

$$\text{Estimated effort in gears} = 31 \text{ days} \times \frac{\text{Sample total gears}}{\text{No. sample days}} \text{ GEARS}$$

The nominator is the computed BOGEARUN given in (2).

The number of sample days is: (4) _____ DAYS

Thus, the estimated total effort is 31 X (2)/(4) = (5) _____ GEARS

Finally, the estimated catch is: (3) X (5) = (6) _____ KGS

If the computations are correct the result should be around 2218 KGS.

Express now the CPUE as KG / TRIPS. How many trips? _____ (7)

CPUE is (1)/(7) = (8) _____ KG/TRIP.

The estimated effort in trips is (9): 31 X (7)/(4) TRIPS.

Thus, the estimated catch is (8) X (9) = _____ KGS. Why the same?

Record#	BONUM	BOSITE	BODAY	BOWDAY	BOGEARUN	BOC1
1	2	2	2	2	3	11
2	4	2	2	2	1	9
3	21	4	2	2	5	10
4	22	4	2	2	1	13
5	32	5	2	2	4	9
6	36	6	2	2	3	6
7	37	6	2	2	1	6
8	43	7	2	2	3	5
9	3	2	4	4	1	9
10	4	2	4	4	1	8
11	19	4	4	4	6	5
12	21	4	4	4	5	13
13	22	4	4	4	1	6
14	31	5	4	4	5	9
15	43	7	4	4	3	9
16	64	10	4	4	6	8
17	71	11	4	4	1	12
18	72	11	4	4	2	7
19	2	2	10	3	3	12
20	22	4	10	3	1	5
21	32	5	10	3	4	10
22	33	5	10	3	2	5
23	36	6	10	3	3	10
24	71	11	10	3	1	10
25	3	2	13	6	1	11
26	4	2	13	6	1	11
27	19	4	13	6	6	12
28	20	4	13	6	4	11
29	21	4	13	6	5	14
30	33	5	13	6	2	13
31	72	11	13	6	2	6
32	3	2	18	4	1	12
33	13	3	18	4	2	8
34	19	4	18	4	6	9
35	22	4	18	4	1	13
36	31	5	18	4	5	11
37	32	5	18	4	4	6
38	33	5	18	4	2	6
39	37	6	18	4	1	12
40	58	9	18	4	6	12
41	71	11	18	4	1	10
42	72	11	18	4	2	5
43	19	4	24	3	6	10
44	20	4	24	3	4	6
45	33	5	24	3	2	12
46	36	6	24	3	3	10
47	37	6	24	3	1	5
48	71	11	24	3	1	9
49	3	2	30	2	1	14
50	13	3	30	2	2	9
51	20	4	30	2	4	6
52	21	4	30	2	5	10
53	43	7	30	2	3	14
54	72	11	30	2	2	7

NATIONAL WORKSHOP ON DATA COLLECTION - GROUP EXERCISE 4 - CATCH/EFFORT

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The purpose of this exercise is to derive estimates of total catches of SPECIES 1, caught by all boats of BOAT TYPE 1 and GEAR TYPE 1 from ALL sites 1-12.

In order to do this SELECTED SITES were covered by recorders during the days of October: 2,4,10,13 (a Saturday),18,24, and 30, for a total of 7 sampling days. During each sampling day SOME boats were recorded.

Next page contains a list of the data collected.

BONUM..... Boat identification number
BOSITE..... Landing Site
BODAY..... Day of the month
BOWDAY..... Day of the week, 1=Monday, ... , 7=Sunday
BOGEARUN..... Number of gear units used by a boat
BOC1..... Catches of SPECIES 1 in KG

The boat and gear types are not shown, as they are all of the 1,1 type.

The first approach to be used is to consider the fishing gear as the statistical unit. Thus the sample CPUE will be expressed as:

CPUE = (Total sample catch / Total sample gears)

Compute total catch by adding the BOC1 column (1) _____ KGS
Compute gear units used by adding BOGEARUN (2) _____ GEARS

CPUE in KG/GEARS = (1)/(2) = (3) _____ KG/GEAR

IT IS NOW ASSUMED THAT THE TOTAL EFFORT IN GEAR UNITS USED IS KNOWN THROUGH A CENSUS AND IT IS EQUAL TO: 641 GEARS.

Thus, an estimate of the total catch is given by:

TOTAL CATCH = (3) X 641 = _____ KGS

If the computations are correct, the result should be around 2124 KGS.

The second approach is to calculate CPUE in terms of KGS/TRIPS. For this purpose we first define the number of trips as:

NO. OF TRIPS = _____ TRIPS (4)

Therefore, CPUE = (1)/(4)= _____ KGS/TRIPS (5)

IT IS NOW ASSUMED THAT THE TOTAL NUMBER OF TRIPS IS KNOWN BY MEANS OF A CENSUS ON EFFORT AND IS EQUAL TO 216 TRIPS.

Thus, another estimate of total catch can be derived from:

Total catch = (5) X 216 = _____ KGS (Correct figure is 2028 KGS).

Record#	BONUM	BOSITE	BODAY	BOWDAY	BOGEARUN	BOC1
1	21	4	2	2	5	10
2	36	6	2	2	3	6
3	3	2	4	4	1	9
4	21	4	4	4	5	13
5	43	7	4	4	3	9
6	72	11	4	4	2	7
7	32	5	10	3	4	10
8	71	11	10	3	1	10
9	19	4	13	6	6	12
10	33	5	13	6	2	13
11	13	3	18	4	2	8
12	31	5	18	4	5	11
13	37	6	18	4	1	12
14	72	11	18	4	2	5
15	33	5	24	3	2	12
16	71	11	24	3	1	9
17	20	4	30	2	4	6
18	72	11	30	2	2	7

GROUP EXERCISE 6: A case study on socio-economic surveys
(Survey forms prepared for the Government of Malawi)

Date : ____/____/ 1990	Interviewer's name:.....

A. Landing Place

1. Stratum n°: ____/ — A_1 |____|

2. Name of the village: ..... Code: ____/ — A_2 |____|

3. Boat-owner's code: _____/ — A_3 |____|

B. Boat-owner identification

1. Is he full-time fisherman? (>10 days/month) ____/1
   part-time " (5< <10 days/month) ____/2
   occasional " (<5 days/month) ____/3
   not fisherman? ____/4 — B_1 |____|

2. Ethnic group: ..... — B_2 |____|

3. Religion: ..... — B_3 |____|

4. Place of birth: ..... — B_4 |____|

5. He is living in this village since ____/ years — B_5 |____|

6. Had he another profession before?
   Yes ____/1 No ____/2 — B_{6A} |____|
   - Farmer ____/1
   - Animal producer ____/2
   - Hired worker ____/3
   - Other (specify) ____/4..... — B_{6B} |____|

7. How many years ago did he start fishing? ____/ years — B_7 |____|

8. Which was his father's profession?
   - Fisherman ____/1
   - Farmer ____/2
   - Animal producer ____/3
   - Hired worker ____/4
   - Other (specify) ____/5.....
   - Doesn't know ____/6 — B_8 |____|

9. Which was his grandfather's profession?
   - Fisherman ____/1
   - Farmer ____/2
   - Animal producer ____/3
   - Hired worker ____/4
   - Other (specify) ____/5.....
   - Doesn't know ____/6 — B_9 |____|

C. Fishing boat information

1. Give the following information about fishing boat(s):

Type	Length	Age (years)	Cost of acquisition	Cost of replacement	Cost of maintenance	
|___|	|____|	|___|	|_____|	|_____|	|_____|/y	$C_{1A1}, C_{1A2}, C_{1A3}, C_{1A4}, C_{1A5}, C_{1A6}$
|___|	|____|	|___|	|_____|	|_____|	|_____|/y	$C_{1B1}, C_{1B2}, C_{1B3}, C_{1B4}, C_{1B5}, C_{1B6}$
|___|	|____|	|___|	|_____|	|_____|	|_____|/y	$C_{1C1}, C_{1C2}, C_{1C3}, C_{1C4}, C_{1C5}, C_{1C6}$
|___|	|____|	|___|	|_____|	|_____|	|_____|/y	$C_{1D1}, C_{1D2}, C_{1D3}, C_{1D4}, C_{1D5}, C_{1D6}$
|___|	|____|	|___|	|_____|	|_____|	|_____|/y	$C_{1E1}, C_{1E2}, C_{1E3}, C_{1E4}, C_{1E5}, C_{1E6}$

2. Does he hire the boat out sometimes?
   Yes ____/1 No ____/2 — C_{2A} |____|
   - payment received in cash: ...../day — C_{2B} |_____|
   - or in fish: ...../day — C_{2B} |_____|

3. Does he own an outboard engine?
   Yes ____/1 No ____/2 — C_{3A} |____|
   - No → does he rent one? Yes ___/1 No ___/2 — C_{3B} |____|
     - at which cost/day? ..... — C_{3C} |_____|
   - Yes → does he use it regularly? Yes ____/1 No ____/2 — C_{3D} |____|

4. Give the following information about the engine(s):

Brand	Horse Power	Age (months)	Cost of acquisition	Cost of replacement	Cost of maintenance	
|___|	|____|	|___|	|_____|	|_____|	|_____|/y	$C_{4A1}, C_{4A2}, C_{4A3}, C_{4A4}, C_{4A5}, C_{4A6}$
|___|	|____|	|___|	|_____|	|_____|	|_____|/y	$C_{4B1}, C_{4B2}, C_{4B3}, C_{4B4}, C_{4B5}, C_{4B6}$
|___|	|____|	|___|	|_____|	|_____|	|_____|/y	$C_{4C1}, C_{4C2}, C_{4C3}, C_{4C4}, C_{4C5}, C_{4C6}$

5. How did he buy:

	the boat(A)	the engine(B)	
- cash:	_____/1	_____/1	
- on credit from:			
relatives	_____/2	_____/2	
bank	_____/3	_____/3	
project	_____/4	_____/4	
fish-trader	_____/5	_____/5	
other (specify)	_____/6	_____/6	C_{5A} |____|
	.....	.....	C_{5B} |____|

D. Fishing gears information

Type	Number	Length	Cost of acquisition	Age (months)	Period of use	
GN						$D_{1A1}, D_{1A2}, D_{1A3}, D_{1A4}, D_{1A5}$
CS						$D_{1B1}, D_{1B2}, D_{1B3}, D_{1B4}, D_{1B5}$
KS						$D_{1C1}, D_{1C2}, D_{1C3}, D_{1C4}, D_{1C5}$
Ch						$D_{1D1}, D_{1D2}, D_{1D3}, D_{1D4}, D_{1D5}$
NK						$D_{1E1}, D_{1E2}, D_{1E3}, D_{1E4}, D_{1E5}$
LL						$D_{1F1}, D_{1F2}, D_{1F3}, D_{1F4}, D_{1F5}$
HL						$D_{1G1}, D_{1G2}, D_{1G3}, D_{1G4}, D_{1G5}$

Note: GN: gillnet
CS: chambo seine
KS: kambuzi seine
Ch: chilimila
Nk: nkacha
LL: long-line
HL: hand-line

E. Sharing system

1. For each kind of fishing gear used by the boat-owner, indicate:

Type	Crew size	Wage/crew member /day or /month	Crew share (% of catch)	Given to assistants	
GN	.....	.....	.....	.....	$E_{1A1}, E_{1A2}, E_{1A3}, E_{1A4}$
CS	.....	.....	.....	.....	$E_{1B1}, E_{1B2}, E_{1B3}, E_{1B4}$
KS	.....	.....	.....	.....	$E_{1C1}, E_{1C2}, E_{1C3}, E_{1C4}$
Ch	.....	.....	.....	.....	$E_{1D1}, E_{1D2}, E_{1D3}, E_{1D4}$
Nk	.....	.....	.....	.....	$E_{1E1}, E_{1E2}, E_{1E3}, E_{1E4}$
LL	.....	.....	.....	.....	$E_{1F1}, E_{1F2}, E_{1F3}, E_{1F4}$
HL	.....	.....	.....	.....	$E_{1G1}, E_{1G2}, E_{1G3}, E_{1G4}$

2. Does the crew bring its own fishing gears?
Yes _____/1 Sometimes _____/2 No _____/3 E_{2A} |____|

└── which kind of gear? _____/ E_{2B} |____|
how does he share the catch, in this case?
.....
..... E_{2C}

3. Do the crew members change from his boat(s) to another?
Yes, from day to day _____/1
Yes, from week to week _____/2
No _____/3 E_3 |____|

4. Does he go fishing in another village during some period of the year? Yes ____/1 No ____/2 — E_{4A} |____|

   └ during which period? ..... — E_{4B} |_____|

   with which fishing gear? ..... — E_{4C} |____|

   where? ..... — E_{4D} |____|

   why? ..... — E_{4E}

5. Does he has to pay to the village head-man to fish?

   in this village Yes ___/1 No ___/2 — E_{5A} |____|

   if he fishes from another village Yes ___/1 No ___/2 — E_{5B} |____|

   if yes, how much? in cash: ...../day — E_{5C} |_____|

   fish: ...../day — E_{5D} |_____|

6. Does he have exclusive rights to fish from a certain beach or to set his nets in a certain area?

   Yes _____/1 No _____/2 — E_6 |____|

F. Destination of the catch

1. To whom does he sell the catch?
   - private trader on the beach ____/1
   - consumer on the beach ____/2
   - fish market ____/3
   - a family member who will sell ____/4
   - he barters ____/5
   - other (specify)..... ____/6 — F_1 |____|

2. How much fish does he keep weekly for home consumption?

   ..... kg/week — F_2 |____|

3. Does he or his wife(ves) process fish? Yes ___/1 No ___/2 — F_3 |____|

4. What are his relationship with fish-traders?
   - only to sell fish _____/1
   - they loan money _____/2
   - they provide fishing boat _____/3
   - they provide fishing gears _____/4 — F_4 |____|

5. Does he sell generally to the same fish-trader?

   Yes _____/1 No _____/2 — F_{5A} |____|

   Why? ..... — F_{5B}

G. Principal and secondary occupation

1. According to income generated, which is his principal occupation during the year?

   fisherman: ____/1 farmer: ____/2 trader: ____/3
   animal producer: ____/4 hired worker: ____/5
   other: ..... ____/6 — G_1 |____|

2. <u>According to income generated</u>, which is his secondary occupation during the year?
fisherman: ____/1 farmer: ____/2 trader: ____/3
animal producer: ____/4 hired worker: ____/5
other: ..... ____/6 — G_2 |____|

3. Are these occupations: permanent seasonal casual?
principal: ____/1 ____/2 ____/3 — G_{3A} |____|
secondary: ____/1 ____/2 ____/3 — G_{3B} |____|

4. If the occupation is seasonal indicate during which month
principal: /__/__/__/__/__/__/__/__/__/__/__/__/ — G_{4A}
J F M A M J J A S O N D
secondary: /__/__/__/__/__/__/__/__/__/__/__/__/ — G_{4B}
J F M A M J J A S O N D

5. <u>According to time spent</u>, which is his principal occupation during the year?
fisherman: ____/1 farmer: ____/2 trader: ____/3
animal producer: ____/4 hired worker: ____/4
other: ..... ____/5 — G_5 |____|

6. <u>According to time spent</u>, which is his secondary occupation during the year?
fisherman: ____/1 farmer: ____/2 trader: ____/3
animal producer: ____/4 hired worker: ____/5
other: ..... ____/6 — G_6 |____|

7. Are these occupations: permanent seasonal casual
principal: ____/1 ____/2 ____/3 — G_{7A} |____|
secondary: ____/1 ____/2 ____/3 — G_{7B} |____|

8. If the occupation is seasonal indicate during which month
principal: /__/__/__/__/__/__/__/__/__/__/__/__/ — G_{8A}
J F M A M J J A S O N D
secondary: /__/__/__/__/__/__/__/__/__/__/__/__/ — G_{8B}
J F M A M J J A S O N D

<u>H. Information on boat-owner's family</u>

1. Give following information about boat-owner:
Age: _____/ years — H_{1A} |____|
Married __/1 single __/2 widower __/3 separated __/4 — H_{1B} |____|
If married, how many wives: __/ — H_{1C} |____|
Education: none ___/1 standard ___/2 Islamic ___/3 — H_{1D} |____|

2. How many children does he have? male: ___/ female: ____/ | H_{2A1} |____| H_{2A2} |____|

How many are at school? male: ____/ female: ____/ | H_{2B1} |____| H_{2B2} |____|

How many have a remunerated job? male: ___/ female: ___/ | H_{2C1} |____| H_{2C2} |____|

How many are working in fishery? male: ___/ female: ___/ | H_{2D1} |____| H_{2D2} |____|

How many persons does he feed regularly? _____/ | H_{2E} |____|

I. Farming and breeding activities

1. How many fields does he and/or his wife(ves) hold? _____/ | I_{1A} |____|

Total superficie of the fields: _____/ | I_{1B} |____|

How did he acquire these fields:
allocated by village headman: ____/1 inherited ____/2
rented: ____/3 other (specify): ____/4 ..... | I_{1C} |____|

2. Indicate his three main cultures: ..... 1 | I_{2A} |_____|

..... 2 | I_{2B} |_____|

..... 3 | I_{2C} |_____|

3. Production culture 1/year: ..... | I_{3A} |_____|

Production culture 2/year: ..... | I_{3B} |_____|

Production culture 3/year: ..... | I_{3C} |_____|

4. Which kind of animal does he keep?

	Number	
a) Cow	____/	I_{4A} |____|
b) Goat	____/	I_{4B} |____|
c) Sheep	____/	I_{4C} |____|
d) Pig	____/	I_{4D} |____|
e) Poultry	____/	I_{4E} |____|
f) Other (specify)	____/	I_{4F} |____|

J. Attitude regarding fishery

1. If he had other employment possibilities:
a) he would stay in fisheries ____/1
b) he would change profession ____/2
c) he doesn't know ____/3 | J_{1A} |____|

Explain why? .....

..... | J_{1B}

2. Would he like his sons to be fishermen?
   Yes ____/1 No ____/2 No opinion ____/3 — J_2 |____|

3. If he earned much money from fishing, he would use it to: (rank in order of priority)
   a) buy consumer goods ____/ — J_{3A} |____|
   b) better education for children ____/ — J_{3B} |____|
   c) buy animals ____/ — J_{3C} |____|
   d) invest in farming ____/ — J_{3D} |____|
   e) buy new gears/boat ____/ — J_{3E} |____|
   f) other (specify) ..... ____/ — J_{3F} |____|

4. If he received a loan, he would invest in: (rank in order of priority)
   a) farming _____/ — J_{4A} |____|
   b) animal production _____/ — J_{4B} |____|
   c) fishery _____/ — J_{4C} |____|
   d) other specify) _____/ ..... — J_{4D} |____|

5. Which are his main problems regarding fishing activities: (rank in order of priority)
   a) fish price too low — J_{5A} |____|
   b) catches too irregular — J_{5B} |____|
   c) catches too low — J_{5C} |____|
   d) fishing gears too expensive — J_{5D} |____|
   e) instability of the crew — J_{5E} |____|
   f) not enough money to invest — J_{5F} |____|
   g) too many people to feed at home — J_{5G} |____|
   h) problems with fisheries administration — J_{5H} |____|
   i) no problems — J_{5I} |____|
   j) other (describe) .....
   .....
   .....
   .....
   ..... — J_{5J} |____|

6. What would he need to improve his situation?

.....

.....

.....

.....

.....

..... J_6

NOTES

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