



REBYC

Reduction of Environmental Impact from Tropical Shrimp Trawling, through the introduction of By-catch
Reduction Technologies and Change of Management
(EP/GLO/201/GEF)

Trinidad and Tobago

Study on the Socio economic Importance of Bycatch in the Demersal Trawl Fishery for Shrimp in Trinidad and Tobago



Proposal

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1.0 Introduction and Background

During the Fifty-third Session of the General Assembly of the United Nations in November 1998, countries involved in the exploitation of fisheries were urged to take action to reduce by-catches, fish discards and post-harvest losses consistent with international law and agreements. As a result, reduction of by-catches and discards of unwanted catch is now a policy for many States, and is also a priority activity under FAO's "*Reduction of discards and environmental impact from fisheries*" programme. That project includes the evaluation of by-catch and discards resulting from various fisheries as well as assessment of the impact of trawling and other similar fishing methods on the sea-bottom and on the environment.

It is well known that shrimp exploitation by tropical trawl fisheries generates significant amounts of non-shrimp bycatch. In some countries, bycatch has become an important source of income, generation of employment and contributes to food supply. In others, by-catch of fish, particularly juveniles are discarded at sea. Many studies have recognized the extreme complexity of bycatch, the nature of which varies much from one country to another. Many different aspects of this issue are closely associated to interrelationships such as biology, ecology, fishing technology, and utilization on the one hand as well as marketing, sociology, economy, management/ regulation/ legislation, communication/ outreach on the other. Conflicts between shrimp trawlers and artisanal fishermen are known to occur and have often necessitated resolution across international borders. It is against this background this project was developed.

2.0 Objectives of the Study

The general objective of the study as interpreted by the consultant is to assess and characterize the importance of landed bycatch from the shrimp trawl fishery in Trinidad and Tobago. More specifically, this project does not aim to deal with all aspects of the bycatch problem at this time, but would rather focus on the following:

- (i) Define the importance of landed bycatch from the shrimp trawl fishery in selected fishing communities of Trinidad and Tobago.
- (ii) Describe the current status and use of bycatch for various fleets from point of landing to point of sale / consumption.
- (iii) Explain the social and economic importance of the landed bycatch to the local and national community.

It is envisaged that the findings from this project would assist in the overall management of the fishery, initiate policy development as well as determine the economic contribution of bycatch to the exploitation of this resource.

3.0 Methodological Approach

The study would focus on three areas of analysis:

- (i) Characterize the features of bycatch and its economic significance to Trinidad and Tobago.
- (ii) Determination of the marketing channels and disposal routes for landed bycatch at the selected landing sites.
- (iii) Estimation of the socioeconomic importance of bycatch to these fishing communities.

3.1 The Economic Significance of Bycatch in Trinidad and Tobago Fishery

The first component of the study would seek to investigate the economic significance of bycatch from the demersal fishery and its relationship to the type of vessel, fishing effort, target catch, bycatch volume /value and the season/time of the year.

For this analysis, existing data on the shrimp trawl fishery collected by the Fisheries Division of Ministry of Agriculture, Land and Marine Resources (MALMR) would be used. The required information includes:

- (i) Data on volumes, values of total bycatch and landed bycatch -- disaggregated by specie and type of fishing vessel

- (ii) Monthly data for the last two years on total bycatch caught and landed for Trinidad and Tobago, disaggregated by volume, value, specie and type of vessel.

3.2 Landed Bycatch Marketing/ Distribution

This component of the study seeks to determine the marketing/disposal channels for landed bycatch at two selected sites: Orange Valley and Otahetie. Accordingly, interviews will be conducted amongst fishers, market managers, intermediaries/wholesalers, fish mongers, processors and others to assess their respective roles. Additionally, the study would seek to derive an estimate of the volume/value and species of bycatch handled as well as their distribution channel and point of final disposal. Analysis of the result of these surveys would assist in characterizing the product flow, marketing destination and economic significance of each marketing channel as well as economic importance of the bycatch business to each trader/entrepreneur.

3.3 Evaluation of the Socio-economic Importance of Bycatch to the Fishing Community

This component of the study aims to determine the socio-economic importance of bycatch to the selected fishing communities. Otahetie and Orange Valley have been selected given the importance of their landing sites for the demersal fishery. A representative sample of households, entrepreneurs/businesses and service providers will be surveyed to ascertain the role and importance of bycatch to food supply, household and business income and employment creation. The overall impact of bycatch on the well being of the community would also be assessed.

In order to characterize the status of the bycatch from the shrimp trawl fishery, historical data provided by the Fisheries Division for the respective communities would be examined and analyzed. Two sets of data will be required for this exercise:

- (iii) Historical data on total volumes, values and species by type of fishing vessels, differentiated in terms of bycatch caught and bycatch landed.
- (iv) Data for the last two years on volume, value, specie of total and landed bycatch by seasonality and type of vessel.

4.0 Work Plan and Execution Schedule

Table 1 below sets out the work plan and activity schedule for conduct of the study. It provides an outline of the major activities to be undertaken as well as the duration schedule. These activities are also summarized in the Gantt Chart for ease of reference.

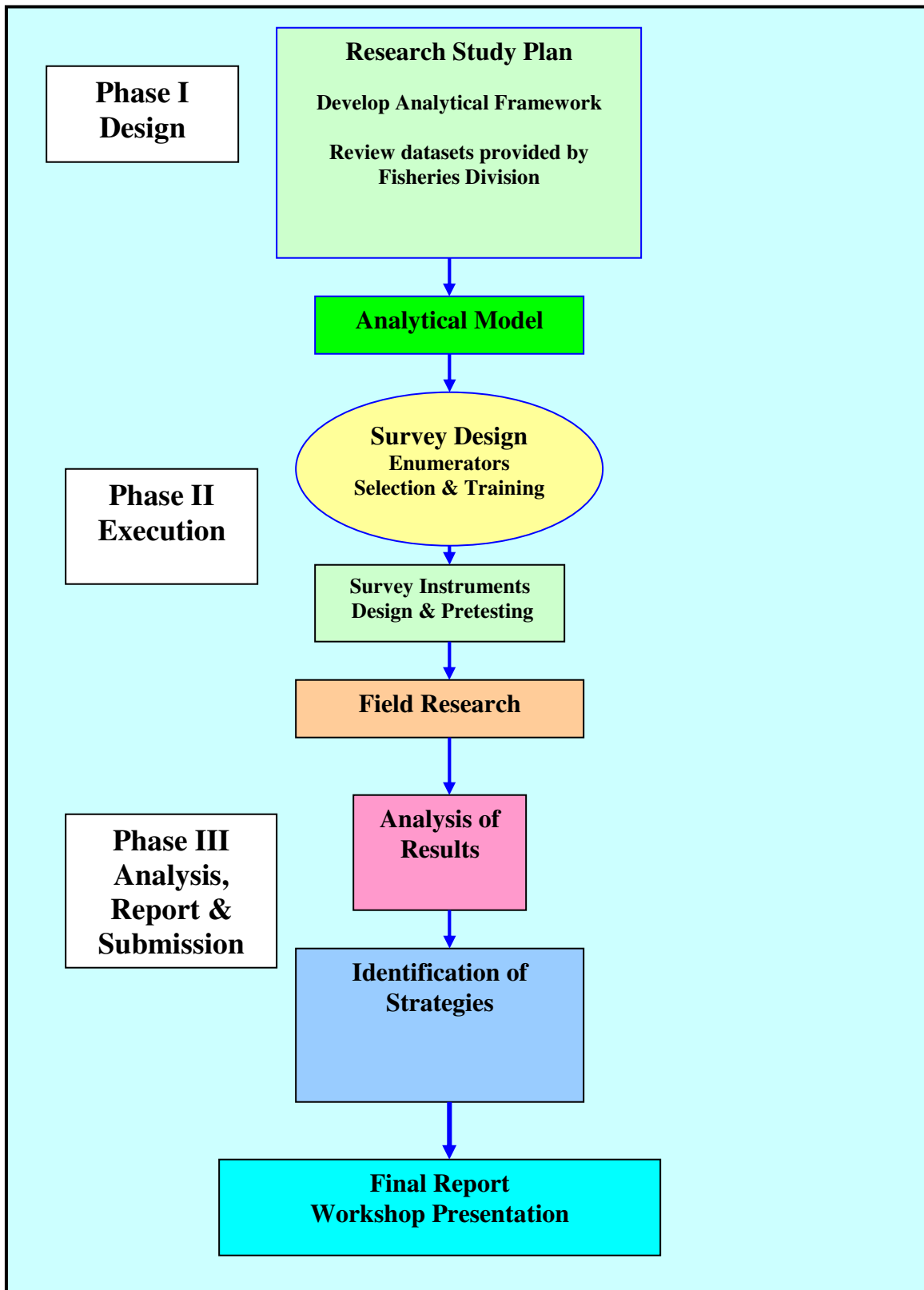
Table 1: Key Project Activities and Duration

Activity #	Activity	Duration (weeks)	Start	Finish
1	Develop analytical framework for evaluating the socioeconomic importance of by-catch	1 week	Week 1	Week 1
2	Review reports on the Trawl Fishery and Bycatch Issue	2 weeks	Week 1	Week 2
3.	Determination of The Economic Significance of Bycatch in Trinidad and Tobago Fishery <ul style="list-style-type: none"> - data collection from the Fisheries Division - analysis of data - Report 	1 week	Week 3	Week 3
4	Determination of Landed Bycatch Marketing/ Distribution <ul style="list-style-type: none"> - Conduct surveys and interview - Data Analysis - Report 	2 weeks	Week 4	Week 5
5.	Determination of the Socio-economic Importance of Bycatch to the Fishing Communities <ul style="list-style-type: none"> -Conduct Survey of Orange Valley and Otahetie fishing communities using structured questionnaires <ul style="list-style-type: none"> (i) Households (ii) Entrepreneurs / businesses (iii) service providers - Analysis of data - Report preparation 	2 weeks	Week 6	Week 7
6.	Prepare Final Draft Report	2 weeks	Week 8	Week 9

5.0 Conceptual / Analytical Framework

The conceptual analytical framework for this study emerges from a consideration of the socioeconomic factors of the related bycatch problem. Figure 1 outlines the conceptual / analytical framework within which the study will be conducted. It sets out the three phases of the study. Phase I embraces the components of the research study plan; Phase II illustrates the data collection component using a face-to-face survey methodology while Phase III is concerned with the analysis of results and identification of strategies for the management of bycatch.

Figure 1: Conceptual / Analytical Framework



6.0 Key Project Activities

In order to conduct the study, a number of key project activities have been identified. These are briefly presented in Table 2 below. Further, a number of key socioeconomic indicators would be developed for the exercise. Some of these would include employment, income, boat building and maintenance, fuel and lubricants, mechanical and other services, gear manufacturing, per caput supply, per caput consumption, food service, sales/intermediaries/fish mongering, processing and other value added activities.

Table 2: Key Project Activities

	Activity	Project Output
1	Develop analytical framework for evaluating the socioeconomic importance of bycatch	Methodology for conduct and analysis of the study
2	Review datasets provided by Fisheries Division	Statistical and specie profile (trend) of bycatch caught and landed for Trinidad and Tobago
3	Discussion / interviews with key stakeholders in each area: (i) Fishers (ii) Market Managers (iii) Intermediaries / wholesalers (iv) Fish Mongers (v) Association & Cooperatives (vi) Processors (vii) Exporters (viii) Sample of individual buyers / consumers (ix) Sample of food service buyers / operators (x) Fishery Department – Data collectors	Profile of linkages between various intermediaries in the fish supply chain
4	Survey of Orange Valley and Otahetie fishing communities using structured questionnaires (iv) Households (v) Entrepreneurs / businesses / input / service providers	Profile of the fishery-based socioeconomics (food basket, expenditure, business related activities) of the selected communities
5	Analyze trends in fishery landings by species and total	Statistical and specie profile (trend) of bycatch caught and landed for the selected communities
6	Review biological assessment	Biological profile (trend) of bycatch caught and landed for the selected communities

7.0 Deliverables (Output)

The major deliverables (as per the Terms of Reference) of the study are as follows:

- (i) A draft final report at the end of Week 9.
- (ii) A final report two weeks after acceptance from the Fisheries Division.

8.0: Resource Allocation and Research Time

In order to successfully undertake this study, strong and proven competencies as well as analytical and research skills will be required. The main consultant and his team identified to undertake the study has more than 100 years of collective experience in all facets of regional agriculture including fisheries and natural resource economics.

Selected postgraduate students from the Faculty of Science and Agriculture will be recruited and specially trained to assist in conducting the fieldwork. The rationale for recruiting postgraduate students is based on the importance of scientific and analytical skills as well as an understanding of research methodology tools and techniques. Further, most of the postgraduate students in the Faculty of Science and Agriculture have already attained field experiences in research surveys. This exercise will also allow them to get further research experience and training. Such an approach can only enhance the quality of the results of this study. Table 3 sets out the resource allocation and research time for each component of the study.

Table 3: Resource Allocation and Research Time

	Key Activity	Professional Time (Mandays)	Research Assistants / Enumerators (Mandays)
1	Develop Analytical Framework	6 Mandays	
2	Review of Data and Analysis	3 Mandays	
3	Design and pre-test Questionnaire	5 Mandays	
4	Field Survey <i>Socioeconomic contribution / Impact of landed Bycatch</i>		
	(a) Orange Valley :		
	<i>(i) Conduct interviews with stakeholders</i>	6 Mandays	
	<i>(ii) Community Survey</i>	5 Mandays	20 Mandays
	<i>(iii) Analysis of data</i>	4 Mandays	4 Mandays
	(a) Otahetie:		
	<i>(i) Conduct interviews with stakeholders</i>	5 Mandays	
	<i>(ii) Community Survey</i>	5 Mandays	20 Mandays
	<i>(iii) Analysis of data</i>	4 Mandays	4 Mandays
5	Review Biological assessment	3 Mandays	
6	Analysis of landings	3 Mandays	
7	Preparation of Report	12 Mandays	
	Total Mandays	61 Mandays	48 Mandays

9.0 Project Budget

The consultant estimates a project of this nature to cost TT\$ 206,790 as presented in Table 4. Funding for the project is to be provided by the Fisheries Division of the Ministry of Agriculture. The University of the West Indies has recognized the difficulties being experienced by the Fisheries Division and has agreed to assist with the funding of the project. In this regard, the Fisheries Division would provide funding to the sum of approximately TT\$ 40,000 and the University would be approached to provide support to the equivalent of the balance in kind, mainly in the form of professional time. The department proposes to develop further capacity in trade policy, exploitation and management of this resource. Further, the results of the study are likely to contribute to the sustainability of the communities which depend on fisheries for their economic livelihood.

Table 4: Project Budget

Resource Requirement	No. of days	Rate per day	Total Cost
Professional Time	61	USD 500.00	US \$30,500.00 (TT\$ 192,150.00)
Research Assistants / enumerators	48	TT \$ 180.00	TT\$ 8,640.00
Transport	20	TT \$ 300.00	TT\$ 6,000.00
		Total Cost	TT\$ 206,790.00

11.0 Gantt Chart

Gantt Chart 1.

	Description of Activity	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
1	Develop analytical framework for evaluating the socioeconomic importance of by-catch										
2	Review reports on the Trawl Fishery and Bycatch Issue										
3	Determination of The Economic Significance of Bycatch in Trinidad and Tobago Fishery - data collection from the Fisheries Division - analysis of data - Report										
4	Determination of Landed Bycatch Marketing/ Distribution - Conduct surveys and interview - Data Analysis - Report										
5	Determination of the Socio-economic Importance of Bycatch to the Fishing Community -Conduct Sample Survey of Orange Valley and Otahetie fishing community using structured questionnaires (vi) Households (vii) Entrepreneurs / businesses (viii) service providers - Analysis of data - Report										
9	Preparation of Report										

Annex 1

Summary of Data Requirements

- (1) Total bycatch in Trinidad and Tobago
- (2) Volume of discarded bycatch by species
- (3) Volume of landed bycatch by species
- (4) Data presented at least in a monthly format over a period of one (1) year
- (5) Fishing Effort -
 - (i) *Drag time or average haul time*
 - (ii) *Time spent at sea*
 - (iii) *Fleet type / inventory and their respective targeted species*
 - (iv) *Gear type*
 - (v) *Vessel holding capacity*
 - (vi) *Fishing Grounds*
- (6) Targeted species – volume / value available for each fleet – monthly data
 - *total shrimp catch*
- (7) Estimate of total bycatch
 - *discards (volume, value, by fleet type and effort)*
 - *landed (volume, value, by fleet type and effort)*
 - *samples of trip tickets*
- (8) Disposal of bycatch (See Table 1).
- (9) Other Disposal
 - (i) *Local Market*
 - (ii) *Export Market*
- (10) Benefit Structures
 - Identification of actors in the Marketing / disposal chain