TECHNOLOGY AND POVERTY IN SRI LANKAN FISHERIES SECTOR, THE CASE OF FOUR FISH VILLAGES IN TANGALLE

By

L. Bandula Perera



The Dissertation was submitted to the Department of Computer Science & Engineering of the University of Moratuwa in partial fulfilment of the requirement for the Degree of Master of Business Administration.

Department of Computer Science & Engineering

University of Moratuwa

December 2005

004 "05"

University of Moratuwa



86333

86333

DECLARATION

I certify that this thesis does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any University to the best of my knowledge and belief it does not contain any material previously published, written or orally communicated by another person or myself except where due reference is made in the text. I also hereby give consent for my dissertation, if accepted, to be made available for photocopying and for interlibrary loans, and for the title and summary to be made available to outside organizations.

2 and

-30th January 2006

(L. Bandula Perera)

University of Moratuwa, Sri Lanka. Electronic Theses & Dissertations www.lib.mrt.ac.lk

Date

Signature of the Candidate

To the best of my knowledge, the above particulars are correct.

(UOM Verified Signature —

Dr.Sarath Dasanayaka

Supervisor

ABSTRACT

Poverty is the greatest challenge we ever face aftermath of the Tsunami tidal waves which hit two third of the coastal belt on 26th December 2004, throwing normal Fishermen life into the dark. People who lived around the coastal areas were lost their lives irrespective of any status. People who escaped from the tsunami have lost their properties and the way of living, pulling them to the poverty of any measurement. A substantial part of the Northern, Eastern and Southern coastal areas were devastated. It clearly showed that the nation is far below with the latest advanced technology and how poor economically to face with such situations. 80% of the fisheries sector damaged; in which 75 per cent of the fishing fleet were damaged which is more than 24,000 boats destroyed which comprising large number of fishing crafts, small-scale fishing crafts and the fishing gears. Of 12 harbours, 10 were severely damaged, including breakwaters, buildings, machinery and equipments. Generally hundred of small businesses and entrepreneurs were badly affected through damage to property, premises, stock; machinery as well as employees displaced injured or perished.

Now it requires a clear mission to fight back poverty Fisheries Sector with a passion and professionalism, integrating every aspect of eradicating poverty, essentially a successful development of a comprehensive, multifaceted and properly integrated policy framework. It has identified the importance of the integration of global and local forces and technological advancement, which must be harnessed to improve the quality of poor people.

The research was carried out as a case study of four fish villages Kudawella, Mawella, Unakuruwa, and Rekawa in Tangalle Fish District in Southern Province. A survey was conducted to identify the current life situation of the fishermen who live in these areas and the hard factors that are affected to their industry such as technological methods, pre and post harvesting planning activities, financial activities, infrastructure and access to new technologies. It has been studied the services and the management activities that have been provided by the key stakeholders as governing bodies of the fisheries sector and to what extent the fishermen effectively use these services. It was identified the roles

and responsibilities of the key stakeholders and introduced a new conceptualized framework by identifying and integrating the key stakeholders to overcome the current barriers in developing the lives of the poor fishermen.

According to the recent survey carried out by the DCS, 30 per cent of the people who are living in Sri Lanka are below the poverty line which Rs.1423.00 on real food and non-food consumption expenditure per person per month (DCS 2002 survey report). It has been studied the historical development in Sri Lankan and studied the technology available, specially the Information Communication Technology which the Sri Lankan Fisheries sector can use to overcome the current pressing issues.

All the key stakeholders in the Fisheries sector must work towards clear objectives such as to assist in the reconstruction and rehabilitation of affected people to enable them to recommence operations immediately with the improved technology, training, accessibility to the world market with improved quality of products.

Total fish production has marginally dropped by 0.1 per cent in the year 2004 (Statistical Unit Ministry of Fisheries 2004). The main causes for the above drop are the price increase in world oil, instability of the government, lack of proper integrated policy implementations system, human diversification for other jobs, lack of latest technology and lack of access to the available technology, the waste of the production, lack of economic value for the product and the lack of proper resources management to introduce a value added product to the market apart from the Tsunami catastrophe.

Therefore it requires a sustainable development to the fisheries sector having a new framework integrating all the stakeholders in the industry aiming for the objectives to eradicate poverty of the bottom level of fishermen in the hierarchy. A mechanism, which will really impact on the livelihood of the fishermen, is required. It shows the importance of such integration and share expert's knowledge and the funds for the future research and development in the industry through monitoring such large investments in the industry. The implementation of new technological innovations within the framework for the beneficial of fishermen who are marginalized and application of technological policies within the framework for sustainable development.

ACKNOWLEDGEMENTS

This work could not be completed without the help of many people and institutions. I thank specially to my supervisor, Dr. Sarath Dassanayake (Management of Technology, University of Moratuwa) for his highly skilled guidance and supervision of the research. His comments from the day I started the project until the drafts I presented to him greatly encouraged me to continue the work. Without his support and supervision this thesis would not have been what it is.

Thank you for your support Mr.Piyasena, Director General of Department of Fisheries to allow me to conduct survey within the department and its regional office District Fisheries Extension Office Tangalle. Mrs. Sumana Ediriweera and Mr.Lal De Silva for supporting me with the current industry position. Thank you Dr.Candana, Head of the Department of Fisheries University of Ruhuna and Mr.Prasad, NAARA, giving me your support to enhance the knowledge fisheries technology and to conduct interviews.

I must thank to my employer, Dr.C.N.A Nonis of Mackwoods IT (Pvt) Ltd. who supported & advised me on the research study and my colleagues helping me in various ways to make this effort success.

I greatly thank to my friends who assist me in conducting the survey in fish villages and helped me in various ways make this report success.

Finally, special mention should go to my loving wife Kumudini and my little kids. She has been supporting and encouraging me at all the time staying with me. She also had to compromise her carrier in support of mine. Things I achieved are because of you.

Bandula Perera

TABLE OF CONTENTS

Abstract	iii
Acknowledgements	v
List of Tables & Figures	
Acronyms and Abbreviations	
Chapter 1: Introduction	1
1.1 Purpose of the study	1
1.2 Problems identified in the fisheries industry	2
1.3 Objectives of the study	3
1.4 Significance of the study	4
1.5 Methodology	5
1.6 Scope of the research study	7
1.7 Limitation of the study	7
Chapter 2: Literature Review	8
2.1 Technology & Poverty analysis	8
2.2 Introduction to the Technology	8
2.3 Introduction to the Poverty	10
2.4 Theory of Structure – Conduct – Performance	12
2.4.1 Structure	12
2.4.2 Conduct	13
2.4.3 Performance	13
2.5 Technology with respect to poverty elimination	13
2.6 The disparity between Rural and Urban in Sri Lanka	14
2.7 Sri Lankan experience in poverty measurement	15
2.7.1 Analysis based on the "Cost of Basic Needs"	15
2.7.2 The official poverty line	16
2.7.3 Poverty estimates using official poverty line	18
2.7.4 Lessons learned from existing poverty studies	19

Chapte	er 3: S	ituational Analysis of the Fisheries Sector	21
3.1	Contr	ibution to the national economy	21
	3.1.1	Fish production	22
	3.1.2	Market Structure of the fishing industry	25
	3.1.3	Government institutions as key stakeholders in Fisheries Sector	26
	3.1.4	Current status of the Fisherman as a key stakeholder in the	30
		Sri Lankan Fisheries Sector	
	3.1.5	Daily income distribution	30
	3.1.6	Technological gaps	31
3.2	Distri	bution of fishing community	31
	3.2.1	Fishing crafts use for the production	32
	3.2.2	Facilities available in each craft	34
	3.2.3	Fishing Gears and Nets use for the target fish production	35
Chapte	er 4: I	History of Technological Development in Sri Lanka	36
4.1	Brief	history of technological development in Sri Lanka	36
4.2	Brief	historical development of Sri Lankan fisheries	37
4.3	Post-	Independence period is me as it	38
4.4	Fishe	eries development in Sri Lanka	40
Chapt	er 5:	Development of Framework for the Sri Lankan Fisheries	42
	!	Sector	
5.1	New	Technological Framework for poverty reduction in Sri Lanka	42
5.2	Conc	eptual Model for the Fisheries Sector	44
	5.2.1	Causes for the poverty	44
	5.2.2	A Framework for action	45
	5.2.3	Opportunity	45
	5.2.4	Self-governance	46
	5.2.5	Security	47
5.3	Deve	lopment Of Technological Framework	48
5 4	Integ	ration of key stakeholders	49

Chapter 6: Technological Direction with ICT usage	55
6.1 Sri Lankan ICT development	55
6.2 Current ICT strategies in Sri Lanka	56
6.2.1 ICT current situation in the Sri Lankan Fisheries Sector	56
6.2.2 Issues that can be addressed through ICT	57
6.3 The other countries practices	58
6.4 The ICT development direction for the Sri Lankan Fisheries Sector.	59
6.4.1 Online Database Management System for the Stakeholders as one	59
platform	
6.4.2 Online Research information	59
6.4.3 Online access to the market information	60
6.4.4 Online registration for fishermen and traders	60
6.4.5 Access information via Internet or Mobile media	60
6.5 Improvements in Fishing Technology within the new framework	61
6.6 Solution through Research & Development	61
6.7 Equipment and information requirement	62
6.7.1 A satellite connectivity to a small type crafts	62
6.7.2 Online Database with actual information	62
Chapter 7: Conclusions and Policy Recommendation	63
7.1 Conclusions	63
7.2 Policy recommendations	64
7.3 Implementation plan for the next five years through finding	67
7.4 Agenda for Future Research	69
References	70
APPENDIX 1: National poverty lines (PL) by district	71
APPENDIX 2: Percentage of poor households based on the official poverty line	72
by district	
APPENDIX 3: Poverty headcount ratio national and by sector	73
APPENDIX 4 : Poverty headcount ratio by district	73
APPENDIX 5: Questionnaires for the stakeholders	74
APPENDIX6: Structured questionnaire survey on technology issues in the	75
current Fisheries Sector	

LIST OF TABLES

Table 1	Poverty headcount ratio National and by sector (%).	15
Table 2	Contribution to the Gross Domestic Product (GDP)	21
Table 3	Annual Fish Production 1992 – 2004	23
Table 4	District level fishing community and the technology use in 2003	32
Table 5	Operating fishing Crafts for the production from 1993 - 2003	33
Table 6	Fisheries activities in Sri Lanka with regards to the policy	40
	implementation and technology development from 1898 to 1995.	
Table 7	The stakeholders in the fisheries industry	48
Table 8	Five Year Strategic Plan for Implementing an Integrated	67
	Information System for the Fisheries Sector	
	LIST OF FIGURES	
Figure 2.1	Elementary Structure of Technology	9
Figure 2.2	The SCP model with reverse linkage	12
Figure 2.3	Poverty headcount ratio National and by sector (%).	15
Figure 2.4	Incidence of Poverty	17
Figure 2.5	Sartorial Disparities of Poverty	18
Figure 2.6	Provincial Distribution of Poor	19
Figure 3.1	Corresponding chart for the fisheries contribution to the GDP 1990 -	22
	2004	
Figure 3.2	Corresponding graph of Fish production from 1992 – 2004	24
Figure 3.3	Current Fish Market Structure	25
Figure 3.4	Crafts used for production	33
Figure 5.1	Framework for Technology and Poverty Reduction in Sri Lanka.	49
Figure 5.2	Conceptual Models in eradication of Poverty 2	44
Figure 5.3	New Framework for the Fisheries Industry in Sri Lanka for purpose	49
	of poverty reduction	
Figure 7.1	Corresponding graph for the strategic plan.	68

LIST OF SYMBOLS, NOTATIONS, ABBREVIATIONS AND ACRONYMS

MFAR – Ministry of Fisheries & Aquatic Resources

MOT – Management of Technology

GDP - Gross Domestic Product

GNP - Gross National Product

ICT – Information Communication Technology

DFEO – District Fisheries Extension Office

DCS - Department of Censes & Statistics

FAO – Food Agricultural Organization

NARA – National Aquatic Resources Research and Development Agency

WHO – World Health Organization

PL - Poverty Lines inversity of Moralium, Sri Lanka.

www.lib.mrt.ac.lk