Impact of Trawl Ban on Employment and Food Security of the Fisher folks in Kerala: an Analysis in the Context of Globalization

Impact of Trawl Ban on Employment and Food Security of the Fisher folks in Kerala: an Analysis in the Context of Globalization

Project Sanctioned by:

Kerala Institute of Labour and Employment

PREFACE

The study "**Impact of Trawl Ban on Employment and Food Security of the Fisher folks in Kerala: an Analysis in the Context of Globalization"** is an outcome of a project funded by the Kerala Institute of Labour and Employment.

The project brings to light the real issues of livelihood, unemployment and poverty of the fishing community under the globalised fishery framework. The status of the fishers with regard to the income, livelihood, living standards and asset holdings are evaluated in the study. The study is classified into five chapters with a clear logistic chain, starting with the basic concepts and ending with the conclusions and policy options. The marine fishing production has undergone drastic changes during the period 1950-2014 owing to the impact of globalization measures. Introduction of mechanized trawlers, outboard motors, opening up the sea for multinational corporations and joint ventures were the major changes which had reverberations in the marine fisheries sector in Kerala. This has culminated into chaos as the real fishers became wage earners and thereby changing the very structure of the fishery into petty capitalistic composition with owners of the mechanized system getting the major share of the catch. Trawl ban periods become endemic problems as they do not have any alternative employment opportunities based on their skill-set. The coastal villages in Kerala witnessed dynamic changes in the labour process with the formation of SHGs and Kudumbashree units to overcome their livelihood and unemployment levels. Though, it is helpful to a certain extent it has to go a long way to overcome the livelihood issues in the fishing sector particularly during monsoon off-seasons and trawl ban periods. Along with this another crucial implication is the issue related to the food security of the people of Kerala during the trawl-ban period. The present national policy of closed season fishing for two months in a way affects every fisher in Kerala in one way or other. Along with this, is opening up of the off-sea area for giving fishing licenses and joint ventures. The fishers of Kerala have already aired their grievances in this respect as over-fishing anywhere in the Indian sea is a threat to fishers everywhere in India. Hence the primary concern of this study is to bring to light the real issues of livelihood, unemployment and poverty of the fishing community under the globalised fishery framework.

Cochin-22,
12th April 2016   D. Rajasenan

ACKNOWLEDGEMENT

Cochin-22,
12th April 2016   D. Rajasenan

EXECUTIVE SUMMARY

Fishing is an economic activity of 775130 poor fishers living in the 222 coastal fishing villages of Kerala depending on the open-access fishery resources and thereby providing food security to the 3.25 crores of people in Kerala. Fishers are quite often locked into the system because of the sticky labour and the cultural setting framed to the sea and its milieu. The dynamics that has happened in the fish economy of Kerala for the last 60 years made several implications in its settings, the unique labour-intensive traditional fishing set-up moved to mechanized labour-saving and subsequently towards highly capital-intensive labour-saving methods. This has culminated into chaos as the real fishers became wage earners and thereby changing the very structure of the fishery into petty capitalistic composition with owners of the mechanized system getting the major share of the catch. This marginalization had helped for the formation of fishers unions to fight against the capitalistic tendency brewing up in the fishing sector with the full-fledged cooperation from the church and clergy as majority of the fishers in Kerala belongs to the Latin Catholic community. It ignited to fierce agitation against the mechanization process and the clout of the mechanized lobby so as to recoup the lost control of the labour process, unemployment, livelihood and poverty. To mitigate the issue the government appointed several expert committees as a strategic measure without doing anything. Hence the fishers' agony continued unabated because of the powerful clout of the mechanized fishing group in Kerala. Because of the continued agitations finally the government had to intervene the fishery system in the form of closed season regulations (trawl ban) barring mechanized vessels operations for a couple of months to recuperate the resource and its sustainability. Though it is laudable in terms of fishery resource sustainability, but it has created large-scale unemployment and misery in the coastal fishing villages, as most of the workers working in the mechanized system are also from the traditional fishers groups. During these trawl-ban periods as they do not have any alternative employment opportunities based on their skill-set. Along with this another crucial implication is the issue related to the food security of the people of Kerala during the

trawl-ban period. This creates more impact to the poor people who are totally depending on low economic species of fish like the sardine and mackerel for their protein requirements.

Statement of the Problem

The marine fishing sector in Kerala has undergone drastic changes with the advent of modernization of this sector. The Kerala model of development mostly bypassed the fishing community, as the fishers form the main miserable groups with respect to many of the socio-economic and quality of life indicators. Employment in this sector is seasonal in nature and technological advancement has made fishers more marginalized from the mainstream society due to income inequality and livelihood insecurity. The marine fish production has undergone drastic changes during the period 1950-2014 owing to the impact of globalization measures. Introduction of mechanized trawlers, outboard motors, opening up the sea for multinational corporations and joint ventures were the major changes which had reverberations in the marine fisheries sector in Kerala. The whole process of egalitarian growth focusing the real fishers in the Kerala marine fisheries started with the mechanization drive under the aegis of the Indo Norwegian Project (INP) in the Kollam region during the 1950s. But soon it was changed into an arena of over investment, export orientation and penetration of non-fishers and hence the sector became a strangled sector to the fishing community and even to the fish economy of Kerala.

Livelihood threat and reduction in earnings from the fish catches *inter alia* marginalization of the traditional fishers led to another development in the fishing sector with the introduction of large scale motorization of the country crafts during the 1980s to recapture the lost power of the labour process in the fishing sector. The traditional fishers also started using the detrimental trawl net to fight against the big clout of the mechanized fishing groups, thereby developed a paradoxical situation in the Kerala fishery as the traditional fishers itself using the trawl nets in their motorized crafts to fight against the mechanized sector. All these led to the alarming decline in the total landings in the fishing sector resulting in conflicts between the traditional and

mechanized fishers for fishing space and output. Increasing conflicts in the beginning of 1980s forced the government to appoint several committees to study the issues that haunted the fishing sector in Kerala. The major impact of this had manifested in the food security of the poor people with alarming decline in the pelagic species which are commonly known as poor peoples' protein. This, in fact, resulted in price escalation for the local fish species, which in turn created a situation of less average per-capita consumption of fish, a real espousal of food insecurity to the poor people. But the resource situation and crisis and struggles between the traditional and mechanized fishers created a situation of trawl-ban in Kerala, the first of such measure in the free independent India in the fishing sector. This ban on bottom trawling during monsoon, in the late 1980s resulted in livelihood and food insecurity of the local fisher folks. Subsequent management and resource recuperation drives too seemed to be unfavorable to the local fishing community.

But the recent trend in the fishing sector of Kerala seemed to be vital as presently Kerala fishery is more in the level of mechanized fishery than traditional in nature. But this has far reaching impact in the employment levels in the fishing sector particularly to the lower end of the fishery chain like women employment (fish vending) and fish peeling in the processing sector and also head load and cycle based fish vending among the coastal fishermen etc. But the coastal villages in Kerala also witnessed dynamic changes in the labour process with the formation of SHGs and Kudumbashree units to overcome their livelihood and unemployment levels. Though, it is helpful to a certain extent it has to go a long way to overcome the livelihood issues in the fishing sector particularly during monsoon off-seasons and trawl ban periods. Another pertinent problem with respect to the trawl ban related unemployment unlike in the early trawl ban periods in the late 1980s to the end of 1990s the present trawl ban issue is ubiquitous in the fishing sector in relation to unemployment. This is because there is no difference between the traditional and mechanized sectors to a certain extent in the mid 2000s onwards and hence unemployment problem is all pervasive during trawl ban

period in the fishing sector. But earlier trawl ban affected only the mechanized fishers but recently it has been affecting all the fishers irrespective of mechanized or traditional.

Background of the Study

Fishery sector in Kerala is crafted with mythological base so as to give prominence to the fishing community in their socio-cultural milieu as the 'Matsya Avathara' of the Lord Vishnu is considered as the embodiment of the fishers to protect the bounty of the sea and the fishing community. Though their life is enmeshed with the sea and the coast, most often they live in poverty with high expectation that the Goddess of the Sea 'Kadalamma' gives what they need to overcome their misery and hence this faith interlocked them in the system. This is the dialogue we envision from the writings of Thakashi as the fishery dialogue of Kerala and soon it worked as the global fishery dialogue. In this way the fish and fishery are pure expectation (random) variables manifesting all kinds of amplitudes in the life and livelihood of the fishing community. Hence, this custom-driven socio-cultural dialogue of the fishers changed into technology-cum-profit-driven dialogue in Kerala. But this metamorphosis is suitable to labour-scarce economies but proved it as miss-fit to labour-surplus economies or even to the fish economy of Kerala. Owing to the technological intrusion following the Indo-Norwegian fishery project, Kerala fish economy witnessed several random impacts, like the bifurcation of the fishing sector into traditional and mechanized, locally embedded system to globally embedded system with export orientation and the incessant neglect of the food security and protein security to the local people. A big blow comes in the form of livelihood insecurity in the form of resource depletion, conflict at sea and the coast, resource un-sustainability and unsustainable fishing practices and mounting unemployment. Hence the primary concern of this study is to bring to light the real issues of livelihood, unemployment and poverty of the fishing community under the globalised fishery framework.

Conceptual Framework

The conceptual framework of the study is linked with income, livelihood and food security of the fishers and the resultant problems like low asset creation, lack of

skill, low living standards and debt burden. Globalization and the allied developments in the fisheries sector created an array of sub-sectors ultimately resulting in a situation of "too many vessels chasing too few fish". This created multifaceted issues like resource depletion, seasonality, variation in catch, shift in landing centres, etc. which directly impacted the income, livelihood and food security of the fisher folk and also resulted in problems like low asset creation, lack of skill, low living standards and debt burden. A recent impact to the fishery is the climate change induced fishing issues. This has high implications in the traditional fishery and traditional fishery based pelagic fish species like sardine and mackerel as these species are seemed to be disappearing in the coastal waters or have a north-ward drift. The result of this has been poverty and social exclusion. The process continued like a vicious nexus involving poverty, exclusion, livelihood issues, lack of skills and assets, etc.

Objectives

The main objective of the study is to evaluate the socio economics of fisher folks of Kerala in terms of livelihood and food security. The sub objectives include:

➤ To study the socio economics and family status of the fishing community.

➤ To evaluate the dynamics of the fishing sector in terms of output changes and its impact in the socio economics of the fishers in an inter-temporal sub-sectoral development scenarios.

➤ To study the impact of trawl ban on the livelihood and employment changes and food security of the fisher folks.

➤ To probe into the effectiveness of government policies in Livelihood enhancement and poverty alleviation among the fisher folks.

Methodology

Fishers in the fishing villages of the state has been divided into of three zones viz. North Zone, Central Zone and South Zone constituting three coastal districts viz. Kozhikode in the North Zone, Ernakulam in the Central Zone and Kollam in the South Zone have been selected for primary survey. Four coastal villages, from each district, are selected and from each village 25 households will be surveyed, thus constituting a

total of 300 households. Data are tabulated on the basis of socio-economic and household characteristics and also for analyzing differences in income, employment, poverty and inequality. Basic statistical tools were used to analyse the data.

Scheme of the Study

The study is classified into five chapters with a clear logistic chain, starting with the basic concepts and ending with the conclusion and policy option. The first chapter sets the background and explains the research issue. It gives details on both theoretical and analytical methodology and review of literature. The second chapter tries to explain the temporal dynamics in the socio economics with the help of basic indicators shifts, which acts as a major stimulating factor for reshaping their socio economics and employment of the marine fishers of Kerala. The Chapter 2 also highlights the development shocks and output changes with sub-sectoral births and its demises and finally to its duality as part of the fishery dynamics of Kerala in terms of output, exigencies and policy interventions. Chapter 3 explains the socio-economic and demographic profiles, livelihood and living standards based on primary data. It also tries to analyse income, inequality and poverty of the fishing community. Chapter 4 analyzes the changes in employment, income and its vicissitudes during the trawl ban in the fishing sector with the help of primary data. The Chapter also evaluates the current status of Kerala marine fisheries as well as the present government schemes based on the fisher's perception. It also presents five case studies. Chapter 5 gives the basic conclusions in a snapshot form along with policy highlights and action plans.

Conclusions

Dynamics of fisheries development

A clever multilateral project infusion in the traditional fishing sector of Kerala with the idea of increasing output for enhancing livelihood made undesired endings with high marginalization of the real fishers. However, the fishing sector was not capable of absorbing the rampant ramification associated with technological changes of trawling, purse-seining, mechanization and hence motorization phase witnessed abnormal resource depletion.

The changing fishery paradoxes with high control of the system by the capitalist groups (non-fishers) with unprecedented gains have resulted in peripheral gains to the real fishers. The struggle for livelihood that ignited in the beginning of the 80s with the proliferation of the fishers union generated the scenario of banning of trawling. Another paradox in the fishing sector in the stagnation phase is the increased fishing assets with decreased earnings- a real espousal of over capitalization. In this phase of the fisheries sector, though the stagnation is all pervasive, it is more visible with respect to economic species. Motorization phases (in the pre-globalised period), though helps the real fishers to fight against the capitalist groups; it also leads to severe stagnation of the entire fishery sector of Kerala. This has also witnessed the birth of a new paradox, traditional fishers form as a major threat group to the mechanized group. This has been carried out with the use of large scale encircling net and other more powerful gears than the mechanized trawl net.

Subsequent fishery regulation and trawling regulation have helped the fishery recuperation and subsequently alarming stagnation with larger livelihood issues. This is well explained with two specific temporal dynamics. First trawl ban period (first decade of globalization) shows moderate dynamics with impressive average of 5572976 tones. The second trawl ban (second decade of globalization) shows also an impressive dynamics with a high average output of 600000 tonnes. In comparison it shows that the first phase of fishery globalization to the second phase, the major dynamics happened in the output contributions of the three visible sectors in the fishing sector. Motorised sector (60.4 percent) has doubled the share of the output of the mechanized (30.2 percent) and more than six times share of the basic traditional sector (9.4 percent).

Sustainability aspects

Sustainability aspects based on empirical estimates of resource sustainability shows that in the pre-globalised period (in three phases) showed an increase (from 0.45 to 0.563 percent) and then to a decrease (0.498 percent) from the historical limits of the catch. But the estimates for the three phases of the post-liberalized ban period shows constancy of the historical percentage changes (from 0.850 to 0.858 to 0.855 percent).

Another notable analysis connected to resource depletion in the pre-ban (pre-globalised) to post-ban (post-globalised) shows that some species like sardine and mackerel have moderate depletion in the post-ban. It also shows better status of depletion stages in the post-ban period in comparison to the pre-ban period.

Family status and socio-economic

Socio-economic and family status of the fishing community shows substantial improvement in post-globalised era in comparison to the pre-globalised period. Living condition of the fishers in the sample area (houses, latrine, drinking water facilities, electrification etc) shows considerable improvement by considering the secondary data source. But still these areas need further improvement to catch up the average basic facilities of Kerala. District-wise evaluation of the Standard of Living Index (SLI) shows wide variation, as Kozhikode sample households (60 percent) are in the low SLI, where as Kollam and Ernakulam fishers percentages respectively are 34 and 16. Out of 300 sample households, irrespective of the district's 39 are only in the high SLI group. But analysis gives impressive pattern with 110 in low SLI, 151 in medium SLI and 39 in high SLI.

Income and livelihood

The occupational structure of the fisheries shows manifold changes with the advent of globalization in the fishing sector. The activity status not only shows regional differences based on fishers households but it illustrates that employed category forms the major share-groups among the household members. The activity status also pinpoints high level of gender bias as 63.8 percent are males in comparison to 11.8 percent females. Dichotomizing the type of activity into fishing and non-fishing, household data show that still fishers employment are mostly connected to the fishing sector.

Sectoral inferences of employment show that motorised sector gives 45.3 percent of the fishing sector employment. Employment pattern during the trawl ban period gives the picture that mechanized fishers are hit the most as 64.6 percent do not have

any job. Trawl ban effect to the total fishers in the sample area shows that 25.8 percent have no alternative means of employment.

Livelihood and income analysis also highlights considerable spatial differences as Ernakulam is coming in the top with 6991.98 average individual incomes and Kozhikode with the lowest income of 6357.30. Gender wise high difference is noticed with respect to individual income in all the three sample districts with some variations. In the case of Ernakulam the male-female income is 6465.53 for males and 3500 for females. Average individual income also varies with respect to activity.

Poverty and inequality

Poverty analysis shows that the poverty level among the fishers is low, but the erratic earnings make them more vulnerable. Empirical estimates of poverty and inequality based on Gini coefficient in the three surveyed districts show that the Kollam fishers' exhibits high inequality (0.326) compared to other two districts fishers. Income poverty of the fishers is higher than the expenditure poverty in the sample villages. Inter-district comparison of poverty explains that Kollam has poorer indicators than Ernakulam in terms of relative incidence and severity.

Financial habits

The fishers have poor financial habits. Income-expenditure pattern of the fishers irrespective of the sample districts shows that expenditure is more than income. This shows that they are always in debt. Analysis based on saving pattern of the fishers shows that 69 percent of the households have regular saving habits with some variations among the sample districts. Savings of the fishers are mostly connected to co-operative societies. Difficulty in assessing formal credit becomes the major issue for their high indebtedness. Though, Kudumbashree penetration is less in the coastal surveyed villages, Ernakulam shows some prominence.

Perception

Fishers perception in various inter connected activities is too weak to link for a good future. Fisher's perception for a permanent shift from fishing to non-fishing even with livelihood issues in the fishing village gives the fact that about 86 percent of the

fishers are unwilling to do so. Skill issues and employment opportunities hinder the fishers to opt for a shifting. But a generational difference as per fishers' perception is obvious as younger fishers are seemed to have such kind of preferences.

Trawl ban impact

Analyzing the post 1950s technological change in the resource based sectors of Kerala; the fishing sector is peculiar with sporadic changes of technology useful to a certain faction and unwanted to most of the real fishers. Trawl ban period employment issue is seemed to be more among male-fishers than female-fishers. Empirical estimates of temporal analysis of employment changes during trawl ban (5 years back, 10 years back and 20 years back) period shows marginal positive changes recently. Income earning during trawl ban also shows wide differences in a sub-sectoral comparison as mechanized fishers have the lowest mean value. Poverty impact based on empirical estimates during trawl ban shows entry of more fishers in poverty and after the trawl ban period similar exit also from property is clear. As the fishers face financial difficulty during the trawl ban period the SHG linked cooperatives play crucial role for financial inclusion of the fishers.

Policy Options

The study comes to some important policy options for immediate interference in the fishing sector of Kerala.

It is necessary to control the number of crafts in each sub-sector based on fishers' involvement by working out the number of active fishers. This will help to control over-capitalization to a certain extent. Motorised-mechanized crafts difference has come down. High horse power engine connected motorised vessels are in fact efficient in fishing operations with high area coverage. It is necessary to control fishing gears like mini-trawls and other detrimental gears as it is widely used by the motorised fishers. This is paradoxical. The protectors have turned into destructors. This is to be curtailed through necessary legislation and monitoring. Hence new craft-gear combination limits are to be worked out with the resource availability and target specie availability.

Fish production sans local peoples consumption for export is not sustainable as it focuses on demersal species resources based on trawling both by the mechanized and high horse power connected motorised units. Hence the focus of fishing is to be changed with policy changes. Mechanized-motorised trawling produces more trash fish. In the beginning it did not fetch any market. Now there is a niche market as input in the fish meal plants and hence there is an agency network for getting more input for the fish meal production. This can easily be controlled with mesh-size regulation. The government has to form an inspection agency for periodic checks to see that the rule is strictly implemented for ensuring resource sustainability.

As economics is playing chaos in the fish extracting sector based on opportunity cost of investment, it is necessary on the part of the government to popularize aquaculture production for safeguarding food and nutritional security for the local people. Fishers' income from fishing is purely a price index spiral, but the government interference through Matsyafed helped high inroads in the sector with high per-rupee-share in the first sale of fish. This is mostly urban-centric. Hence more involvement is required in all the 222 coastal fishing villages.

As fishing sector is the only resource based sector in Kerala with endemic encounters for livelihood and in this, one is gained with the loss of the other, a real game rhetoric play. In this respect it is essential on the part of the government to protect the losers through appropriate livelihood schemes suiting to the socio-cultural milieu of the fishing community.

Trawl ban era needs special care to protect the fishers from unemployment and temporary entry to poverty severity and threshold. Any management measure globally in the fishing sector will become successful if the fishers' unemployment and livelihood is safeguarded through welfare and other compensation measures by the government. An easy policy measure to effectively implement is MGNREGA in the mechanized fishing hubs of Kerala during the trawl ban period and ensure the participation of a household member form the fishers. 60 days participation of a family will help to obtain an income of about Rs 7000 per month.

It is well known that the fishers are the best managers of the fishery as it is their basic sustenance; hence any fishery policy regarding craft, gear or closed seasons need to address their concerns and value their knowledge in the fishing system and the resource pattern.

Action plan

The study has helped to suggest the policy makers to develop necessary action plan based on its urgency.

Short-term

a) Urgent step is warranted to control over capitalization of fishing assets (fishing crafts and gears).

b) Legal measures and strict control of the Horse Power of the motorized vessels, as the number of the motorised vessels are increasing more than the required as per the resource availability.

c) It is required to control of mini-trawl and the detrimental gears as it endangers fishery sustainability.

d) Fishers are to be assisted properly during the trawl ban period in the form of daily unemployment allowances or assistance through MGNREGS for sustenance and livelihood.

Medium-term

a) New craft-gear combinations that are suited regionally for fishing to be worked out.

b) Based on the resource pattern it is required to control the number of fishmeal plants as it affects the fish resources sustainability.

c) It needs to ensure alternate livelihood issues through skill development and training to release the surplus labour from fishing to non-fishing activities. This could be implemented by linking 10 close-knit fishing villages in the coast with a training centre for skill development for alternative livelihood.

d) Periodic assessment of resources and its carrying capacity, employment and income level of the fishers are to be made.

e) To ensure that the central and state assistances to the fishers are reached in the hands of the real fishers.

Long-term

a) Need policy shifts from fishing for export to fishing for local consumption. This will *inter alia* protect the fishery from the trawling impacts.

b) Need to develop a clear data bank for research and development of the fishing sector, which is totally lacking at present. There are lots of differences in the statistics available from the state and central agencies which needs to be addressed properly.

Contents

Title	Page No

Detailed Contents

List of Tables

List of Figures

List of Box

List of Appendices

Acronyms

ANOVA	Analysis of Variance
APL	Above Poverty Line
BPL	Below Poverty Line
CMFRI	Central Marine Fisheries Research Institute
CPEU	Catch Per Unit Effort
CSSEIP	Centre for the Study of Social Exclusion and Inclusive Policy
FAO	Food and Agricultural Organisation
FGT	Foster-Greer-Thorbecke
GC	Gini Coefficient
HCI	Head Count Index
HLPE	High Level Panel of Experts on Food Security and Nutrition
INP	Indo Norwegian Project
KIFF	Kerala Independent Fishermen Federation
KMFRA	Kerala Marine Fishing Regulation Act
KSPB	Kerala State Planning Board
MMUCS	Marianadu Malsya Ulpadaka Cooperative Society
MPCE	Monthly Percapita Expenditure
NBCFDC	National Backward Classes Finance Development Corporation
NFWF	National Fish Workers Forum
NGOs	Non-Governmental Organization
NMDFC	National Minorities Development & finance Corporation
NSDP	Net State Domestic Product
OBCs	Other Backward Communities
PCE	Percapita Expenditure
PCI	Percapita Income
PCO	Programme for Community Organization
PGI	Poverty Gap Index
SCs	Scheduled Castes
SHGs	Self Help Groups
SIFFS	South Indian Federation of Fishermen Societies
SLI	Standard of Living Index
SPGI	Severity of Poverty
STs	Scheduled Tribes
TV	Television

Chapter 1

Introduction

Fishing is an economic activity of 775130 poor fishers living in the 222 coastal fishing villages of Kerala depending on the open-access fishery resources and thereby providing food security to the 3.25 crores of people in Kerala. Fishers are quite often locked into the system because of the sticky labour and the cultural setting framed to the sea and its milieu. Hence any change in this setting, either fishery or non-fishery factors connected to the system will have high implications in employment and earnings of the fishers. The dynamics that has happened in the fish economy of Kerala for the last 60 years made several implications in its settings, the unique labour-intensive traditional fishing set-up moved to mechanized labour-saving and subsequently towards highly capital-intensive labour-saving methods. This has culminated into chaos as the real fishers became wage earners and thereby changing the very structure of the fishery into petty capitalistic composition with owners of the mechanized system getting the major share of the catch. In this formation most of the owners of the mechanized fishery are from non-fishers community and investing for profit in tune with the export oriented proliferation on the part of the policy diversion for more foreign exchange earnings. This marginalization had helped for the formation of fishers unions to fight against the capitalistic tendency brewing up in the fishing sector with the full-fledged cooperation from the church and clergy as majority of the fishers in Kerala belongs to the Latin Catholic community. It ignited to fierce agitation against the mechanization process and the clout of the mechanized lobby so as to recoup the lost control of the labour process, unemployment, livelihood and poverty. To mitigate the issue the government appointed several expert committees as a strategic measure without doing anything. Hence the fishers agony continued unabated because of the powerful clout of the mechanized fishing group in Kerala. Because of the continued agitations finally the government had to intervene the fishery system in the form of closed season regulations (trawl ban) barring mechanized vessels operations for a couple of months to recuperate the resource and its sustainability. Though it is laudable in terms of fishery resource sustainability, but it has created large-scale unemployment and misery in the coastal fishing villages, as most of the workers working in the mechanized system are also from the traditional fishers groups. During these trawl-ban periods as they do not have any alternative employment opportunities based on their skill-set. Along with this another

crucial implication is the issue related to the food security of the people of Kerala during the trawl-ban period. This creates more impact to the poor people who are totally depending on low economic species of fish like the sardine and mackerel for their protein requirements.

1.1   Statement of the Problem

The marine fishing sector in Kerala has undergone drastic changes with the advent of modernization of this sector. The Kerala model of development mostly bypassed the fishing community, as the fishers form the main miserable groups with respect to many of the socio-economic and quality of life indicators. Employment in this sector is seasonal in nature and technological advancement has made fisher folk more marginalized from the mainstream society due to income inequality and livelihood insecurity. This kind of seasonality nature of the fishing sector employment has been further accentuated with total unemployment during the trawl ban period of June-August. Barring some ecological and occupational issues, the marine fisheries sector has been growing at a decent pace in the state. The marine fish production has undergone drastic changes during the period 1950-2014 owing to the impact of globalization measures. Introduction of mechanized trawlers, outboard motors, opening up the sea for multinational corporations and joint ventures were the major changes which had reverberations in the marine fisheries sector in Kerala. The whole process of egalitarian growth focusing the real fishers in the Kerala marine fisheries started with the mechanization drive under the aegis of the Indo Norwegian Project (INP) in the Kollam region during the 1950s. But soon it was changed into an arena of over investment, export orientation and penetration of non-fishers and hence the sector became a strangled sector to the fishing community and even to the fish economy of Kerala.

Mechanization in the 1950s opened up the sector a great deal as it began to attract people belonging to non-fishing community, nonetheless this has also resulted in a new form of conflicts for space and species between the traditional and mechanized fishers. This has also resulted in new developments in the fishing sector. Initially it helped the fishing community with greater employment opportunities in the harvest and post harvest sectors. The initial spurt in production helped the food security in terms of protein to the poor people of the state with increased per-capita consumption of fish. But soon it led to the development of a technology-driven new labour process with new production and export chains loosing the employment

opportunities and livelihood of the real fishers. Introduction of purse-seining in the late 1970s also saw the reduction in the labour utilization in the fishing sector.

Livelihood threat and reduction in earnings from the fish catches *inter alia* marginalization of the traditional fishers led to another development in the fishing sector with the introduction of large scale motorization of the country crafts during the 1980s to recapture the lost power of the labour process in the fishing sector. The traditional fishers also started using the detrimental trawl net to fight against the big clout of the mechanized fishing groups, thereby developed a paradoxical situation in the Kerala fishery as the traditional fishers itself using the trawl nets in their motorized crafts to fight against the mechanized sector. All these led to the alarming decline in the total landings in the fishing sector resulting in conflicts between the traditional and mechanized fishers for fishing space and output. Increasing conflicts in the beginning of 1980s forced the government to appoint several committees to study the issues that haunted the fishing sector in Kerala. The major impact of this had manifested in the food security of the poor people with alarming decline in the pelagic species which are commonly known as poor peoples'' protein. This, in fact, resulted in price escalation for the local fish species, which in turn created a situation of less average per-capita consumption of fish, a real espousal of food insecurity to the poor people. But the resource situation and crisis and struggles between the traditional and mechanized fishers created a situation of trawl-ban in Kerala, the first of such measure in the free independent India in the fishing sector. This ban on bottom trawling during monsoon, in the late 1980s resulted in livelihood and food insecurity of the local fisher folks. Subsequent management and resource recuperation drives too seemed to be unfavorable to the local fishing community.

But the recent trend in the fishing sector of Kerala seemed to be vital as presently Kerala fishery is more in the level of mechanized fishery than traditional in nature. But this has far reaching impact in the employment levels in the fishing sector particularly to the lower end of the fishery chain like women employment (fish vending) and fish peeling in the processing sector and also head load and cycle based fish vending among the coastal fishermen etc. But the coastal villages in Kerala also witnessed dynamic changes in the labour process with the formation of SHGs and Kudumbashree units to overcome their livelihood and unemployment levels. Though, it is helpful to a certain extent it has to go a long way to overcome the livelihood issues in the fishing sector particularly during monsoon off-seasons and trawl ban periods.

Another pertinent problem with respect to the trawl ban related unemployment unlike in the early trawl ban periods in the late 1980s to the end of 1990s the present trawl ban issue is ubiquitous in the fishing sector in relation to unemployment. This is because there is no difference between the traditional and mechanized sectors to a certain extent in the mid 2000s onwards and hence unemployment problem is all pervasive during trawl ban period in the fishing sector. But earlier trawl ban affected only the mechanized fishers but recently it has been affecting all the fishers irrespective of mechanized or traditional.

1.2   Background of the Study

Fishery sector in Kerala is crafted with mythological base so as to give prominence to the fishing community in their socio-cultural milieu as the „Matsya Avathara" of the Lord Vishnu is considered as the embodiment of the fishers to protect the bounty of the sea and the fishing community. Though their life is enmeshed with the sea and the coast, most often they live in poverty with high expectation that the Goddess of the Sea „Kadalamma" gives what they need to overcome their misery and hence this faith interlocked them in the system. This is the dialogue we envision from the writings of Thakashi as the fishery dialogue of Kerala and soon it worked as the global fishery dialogue. In this way the fish and fishery are pure expectation (random) variables manifesting all kinds of amplitudes in the life and livelihood of the fishing community. Hence, this custom-driven socio-cultural dialogue of the fishers changed into technology-cum-profit-driven dialogue in Kerala. But this metamorphosis is suitable to labour-scarce economies but proved it as miss-fit to labour-surplus economies or even to the fish economy of Kerala. Owing to the technological intrusion following the Indo-Norwegian fishery project, Kerala fish economy witnessed several random impacts, like the bifurcation of the fishing sector into traditional and mechanized, locally embedded system to globally embedded system with export orientation and the incessant neglect of the food security and protein security to the local people. A big blow comes in the form of livelihood insecurity in the form of resource depletion, conflict at sea and the coast, resource un-sustainability and unsustainable fishing practices and mounting unemployment. Though their life is precarious in these circumstances, the galloping fish price index forms a solace to keep them on fishing. However, the worker capitalist dichotomy soon seasoned the fishers to go for a revolution in overthrowing the existing mode to a changed one in the form of motorization. Though it generated some adjustment problem in the beginning, soon it formed as the new technology of traditional fishers to fight against the mechanized capitalist

group. Along with this, the traditional fishers also started using all kinds of gears that have been used by the mechanized vessels, giving way to a synthesis in the form of perennial resource depletion and decline in catch. All these are the reasons for the turn-around in policy shift for closed season regulations in Kerala which started in the year 1988, the first of such kind in the history of the fish economy of India. It helped in stabilizing the fishing output but it also paved the way for another crisis in Kerala in the form of unemployment and poverty in the seasonal trawl ban periods. Looking this in a different angle, it is obvious that the investors in the fishery mechanized systems though have problems; its impact is wide to the fishers in the form of direct and indirect employment as most of the workers in the mechanized fishery are also the traditional fishers. Yet another issue which has wide implications in Kerala fishery recently is that ninety percent of the traditional fishing crafts is motorised crafts fishing beyond 16 kms as most of the coastal waters are heavily overfished. The present national policy of closed season fishing for two months in a way affects every fisher in Kerala in one way or other. Along with this is opening up of the off-sea area for giving fishing licenses and joint ventures. The fishers of Kerala have already aired their grievances in this respect as over-fishing anywhere in the Indian sea is a threat to fishers everywhere in India. Hence the primary concern of this study is to bring to light the real issues of livelihood, unemployment and poverty of the fishing community under the globalised fishery framework.

1.3   Traditional fishery economy

Fisheries sector is one which provides livelihood to one of the most marginalized sections of the state. There are three activities in the fisheries sector viz. harvesting, processing and marketing. Harvesting is related to means of production and production relations of those who are involved in fishing. The means of production involve equipments and tools used for searching and trapping fish and production relations are relationship between equipment owner and worker in fishing. There are two types of ownership pattern of equipments in the traditional sector – individual (includes ownership by family) and collective. Individual ownership is seen in small non-motorised and small crafts with outboard engine. Collective ownership is seen in the case of larger units with a group of persons owning fishing assets. Distribution of earnings from catch is in the form of share of produce. Net income from sales after deducting all the operating expenses is divided as return to capital and return to labour. The former is termed as equipment share and the latter, crew share. The crew share is further apportioned among the

members of the crew. In the case of individual units this share is divided equally. In the case of collective ownership, hired workers are also included as casual labourers or contract labourers. In some villages there is also a social nesting system called „karanila" in which those fishermen who are unable to participate in fishing in the seashore and touch the craft at the start of the trip are considered as crew for that day for sharing the proceeds. The required number from the total present will get into the craft and go fishing, which generally include owners and group of semi-permanent workers. The remaining "temporary" worker-fishermen stay back on the shore and granted „karanila" or "shore status". The role of „karanila" fishermen in the fishery gains extra importance in two specific situations. When the size of the ownership group is small, the permanent and semi-permanent fishermen together are not sufficient to operate a fishing unit and in such circumstance „karanila" fishermen are crucial. During chakara season it becomes necessary and lucrative to make more than a single trip per day, which necessitates number of crew, more than the usual one. As the „karanila" fishermen are not "attached" to any particular unit meant that they are free to leave the unit when the fishing season is bad, to seek better employment opportunities. This provision ensured prevention of undue fishing pressure during lean seasons. This „karanila" system was a recent custom-created mechanism (just over 50 years old) for ensuring an adequate supply of labour to the fluctuating needs of fishery. It was also a system for income spreading as it provided the basis for fuller work opportunities. It ensured a fair degree of distributive justice so long as there was community control on the number of fishing units in the village and good, stable fishery. But competition and over-investment resulted in erosion in this kind social income spreading process as well as heavy drop in catch rates and unemployment of large number of people owing to the eclipse of several units form fishing. Hence the existing units had to absorb more „karanila" fishers than what is possible to a unit. In certain situation the working fishers at sea have to share their equally with others sanding at the shore.

The major problem experienced by the traditional sector seems to be a reduction in production, output per-craft, share of value and per-capita income. By the end of 1990s itself the real traditional sector using traditional crafts alone is in the stage of extinction as 95 percent of the total out is contributed by the motorised and the mechanized sectors. Out of this about 51 is the share of the motorised sector alone and the mechanized sector contribution comes to about 44 percent, giving rise to a mere 5 percent share to the traditional sector (Nair, 2000). Because of

heavy motorization the coastal sea is heavily over fished and the motorised fishermen experienced fall in average catches and most of the situation below optimum level of income. Because of the difficulty in reallocating the capital invested they continue to stay to stay in the sector for basic sustenance.

The fishers" economics is basically connected to their catch and its earnings in comparison to input costs. The input cost in motorised fishing is high as it incurs diesel costs and this is connected with fishing operations and its coverage. In an overfished system fishing cost is directly proportional to the time spent in fishing, which in most of the situation is more. Earning from fishing is also highly correlated with unit price of the species on the shore. The motorised sector basically fishing for local economic species, its price is invariably connected to the landings of the same species by other vessels. Because of the resource pattern there is high possibility that most of the vessels landing in a region have identical species composition and hence the unit price is expected to be less. Though it is possible to understand the differences in price in various auction centres based on mobile phones or so, there are strict stipulations for shore based fishing operations and fish landings. Hence they cannot take the advantage in high unit value available elsewhere. The marketing activity in the pre-motorization period was dominated by women. But this had changed visibly in the mechanized-motorised phase, which has been characterized by long supply chains along with high consumer demand as result of income growth of the people. This has paved the way for the development of a new merchant class in fish trade both for the domestic and foreign markets with their own labour force. This has also paved the way for the birth of a new group of financiers to fishers thereby interlocking credit and output which is different from the traditional method of credit and output link as seen in the rudimentary fishery production system. These merchants gradually reaped control over the market and prices and the actual fishermen were deprived of the benefits of increase in fish prices, expansion of the market and technological advancement. In this system women have fewer roles in marketing and hence lead to changed dynamics in the labour force in the fishery system. Subsequent intervention of the Matsyafed in auctioning with the help of centralized landing helped marginally but still the financiers-cum marketers in certain pockets play crucial role in exploiting the fishers. Though fishers have slightly benefited from this centralized landing process, the women role is in fish marketing is changing in this process also.

Traditional fishing in Kerala witnessed two dynamic changes with the help of the contested terrain, first is motorization and second is through the introduction of ring seines. These two are necessities for their survival. These actions and reactions and its synthesis made the system vulnerable for resource recuperation. Fishery output started showing the tendency of economic and biological overfishing, which in turn leads to the tragedy of the commons. Production data started showing fluctuating tendency. In this stage the immediate impact is unemployment and livelihood issues. Combining the seasonality component in fishing the coastal area becomes the pockets of poverty, unemployment and livelihood issues. In this background any society or community will think of alternative livelihood as the opportunity cost involved in fishing is considerably low. But the skill set in fishing is not useful in any other shift. This is well exemplified by Panayotou (1982) as decline in employment opportunity reduces the cost of fishing and the over dependence on fishing discouraging exit and encouraging new entry which, in turn leads to further resource depletion. But presently this is also slowly changing as some of the fishers started working in petty jobs like painters, masons and helpers in the construction and other sectors which are well paid in Kerala.

1.4   Fish Economy of Kerala

Kerala stood first as the fish producing state for several years and the state recedes to the second position after Gujarat in the recent decades in marine fish production.   But Kerala has also exhibited wide amplitude in production recently. Kerala‟s fish economy encompasses 9 districts of Thiruvananthapuram, Kollam, Alappuzha, Ernakulam, Thrissur, Malappuram, Kozhikode, Kannur and Kasargod with 178 fish landing centres and 222 fishing villages. Out of the 30776 fishing vessels are registered in Kerala, majority is motorized vessels. Output share gives the picture of motorised hegemony. The comparative analysis of the inland and marine fishing shows high predominance for the marine sector and the combine share in GDP to the state comes to 10.13 percent from the primary sector (Directorate of Fisheries, 2015).

Barring some ecological and occupational issues, the marine fisheries sector has been growing at a decent pace in the state. Fish production in Kerala during 1950-2013 is shown in Table 1.1. The marine fish catch fluctuated largely due to the entry of new players with advanced crafts and gears. The fish production during the year 2000 was 604113 tonnes (CMFRI, 2009), which declined to 530638 tonnes during 2012-13 and 522000 tonnes in 2013-14.

Kerala has been considered as one of the major contributors to the country's seafood exports. The seafood export sector got special significance in the mechanization drive. The export increased from Rs. 183.93 crores to Rs. 3435.85 crores (2012-13). An evaluation of the 20 years data on fishery exports from Kerala shows that the share of fisheries exports in terms of quantity was above 20 percent until 2000-01. Since then, the quantity as well as the percentage share of export has been steadily declining until 2003-04. Despite the unhindered spurt in the international trade indicators and export orientation in this sector, the share of fisheries in terms of its contribution in the Net State Domestic Product has been declining. From 3.05 percent during 1990-91, the share of fisheries in NSDP has declined drastically to 1.17 percent during 2010.

Table 1.1. Marine Fish Production in Kerala 1950-2013

Year	Quantity (in tonnes)	Year	Quantity (in tonnes)	Year	Quantity (in tonnes)	Year	Quantity (in tonnes)
1950	202047	1966	346744	1982	325367	1998	542696
1951	191032	1967	364829	1983	385817	1999	507287
1952	129345	1968	345301	1984	394372	2000	604113
1953	111999	1969	294787	1985	325536	2001	593783
1954	117034	1970	392880	1986	382791	2002	603286
1955	105457	1971	445347	1987	303286	2003	608525
1956	152213	1972	295618	1988	468808	2004	601863
1957	309926	1973	448269	1989	647526	2005	536215
1958	294655	1974	420257	1990	662890	2006	591902
1959	191375	1975	420836	1991	564161	2007	619255
1960	344605	1976	331047	1992	560742	2008	670095
1961	267494	1977	345037	1993	574739	2009	517720
1962	191421	1978	333739	1994	540813	2010-11*	560398
1963	202380	1979	330509	1995	531646	2011-12*	553177
1964	317974	1980	279543	1996	572005	2012-13*	530638
1965	339173	1981	274395	1997	574774	2013-14#	522000

Source: CMFRI, 2009; * KSPB, 2014; # Government of Kerala, 2015

1.4.1 Fishery System in Kerala

Table 1.2 shows the basic fisher system of Kerala. The total marine fisher folk population in the state during 2014-15 is 783899, with 183410 active fishermen. Out of the 222 marine fishing villages in the Kerala state, the Kozhikode, Ernakulam and Kollam together house 82 villages and the total combined coastline of these three districts stretches to 154 km. The share of fish production of the three districts comes to 49.96 percent in terms of quantity and 52.98 percent in terms of value. The three coastal districts also hold the lion's share of the mechanized crafts as per the Kerala Marine Fisheries Statistics (2010).

Table 1.2. Fisheries Profile of Kerala 2014-15

No	District	Length of Coastline	Fishing villages	Population	Active fishermen	Fish landing centers	Fish Production	
							Q (MT)	V (Rs. Lakhs)
1	Kollam	37	27	92500	18561	18	72270	95537
2	Ernakulam	46	21	72119	13230	20	95023	108415
3	Kozhikode	71	34	97987	21769	19	94740	117480
	Total	154	82	262606	53560	57	262033	321432
	% share	26.10	36.94	33.50	29.20	30.48	49.96	52.98
	Kerala	590	222	783899	183410	187	524468	606652

Source: Directorate of Fisheries, 2015

1.4.2 Crafts and gears operating in the Marine fisheries sector in Kerala

Though there are differences in regional use of the gears in Kerala, the common gear that has been used for fishing is gillnet (35 percent) followed by Drift net (16 percent) and Trawl net (10 percent).

Table 1.3. Craft and Gears used in Kerala marine fishery sector

	Thiruvananthapuram	Kollam	Alappuzha	Ernakulam	Thrissur	Malappuram	Kozhikode	Kannur	Kasargod	Total
Gears Used										
Trawlnet	371	375	288	12	13	450	155	32	57	1753
Gillnet	1819	23	754	207	292	598	1048	269	653	5663
Driftnet	341	25	1218	572	49	64	155	122	62	2608
Ringseine	33	35	244	54	32	1017	111	56	57	1639
Purseseine	35	11	72	4	26	25	14	8	1	196
Boatseine	303	12	64	14	5	23	11	2	3	437
Bagnet	55	2	35	38	77	2	6	78	10	303
Shoreseine	187	7	7	4	35	29	60	63	93	485
Castnet	25	30	31	309	63	182	300	37	104	1081
Hooks & Lines	746	66	1	16	0	1	18	9	0	857
Troll line	155	4	0	0	0	0	1	2	0	162
Fixed net	2	2	26	13	0	0	0	1	0	44
Traps	4	0	0	0	0	0	0	0	0	4
Scoopnet	144	7	9	5	2	0	0	8	5	180
others	50	335	60	45	17	5	8	9	0	529
Crafts Used										
Trawlers	0	950	30	1020	130	200	950	237	161	3678
Gillnetters	0	5	0	403	0	2	0	50	0	460
Ring Seiners	0	35	8	90	65	150	110	33	4	495
Liners	0	3	0	15	0	1	5	5	0	29
Purse-seiners	0	0	0	60	0	0	0	0	0	60
Total Mechanized	0	993	38	1588	195	353	1065	325	165	4722
Motorized	2880	546	1503	531	670	1571	1831	542	1101	11175
Non-Motorized	2304	299	1980	146	217	186	260	97	395	5884
Total	5184	1838	3521	2265	1082	2110	3156	964	1661	21781

Source: Marine fishery census, 2010

Spatially Gill net is used in Trivandrum, Thrissur, Kozhikode, Kannur and Kasargod districts, where as Driftnet is common in Ernakulam and Alapuzha districts (Table 1.3). Crafts statistics

show that there are 34641 registered vessels as on Aug 2015 (GoK, 2015), but sub-sectoral levels 28222 (81 Percent) are in the motorized non-mechanical, 4113 (12 Percent) in the motorized mechanical and 2306 (7 percent) in the Non Motorized. Mechanized vessels are distributed mostly in the three mechanized fishery hubs of Kerala with predominance in Ernakulam, followed by Kollam and Kozhikode districts. But in the case of motorized and non-motorized crafts Trivandrum and Alappuzha districts have high predominance (Table 1.3).

1.5   An Overview of Literature

Scanning the global literature on fisheries encompassing socio economics, employment, family status and food security shows all pervasive nature of under-development, poverty linked poor standard of living, perennial unemployment and paucity of skill to get acclimatized to the changing development scenario. Dwindling catch structure of the fishing sector, overcapitalization, over-exploitation and detrimental trophodynamics of the fishery expose the reality of the system to un-sustainability and threat to the food and protein security to the poor people who are depending on fish and fisheries.

1.5.1   Socio Economics

Fishery economics literature explains that fishers have experienced a transition from the dismal state to a stage of development. This is well documented in the case of countries like Norway, Canada etc, where fisheries have contributed to social well being and economic growth, as the question of poverty among fishermen was a serious matter of concern in the early stages of economic development). The structural changes in the sector coupled with trade liberalization impacted the socio-economic foundation of the fisheries sector in a multi-faceted manner (Charles, 2001). Considerable improvement in the standard of living has also been noticed in the case of Malaya fishermen during the 1970s onwards, though Firth (1947) explains the pathetic situation of the fishers in the 1930s and 1940s. The stage of Mapplia fisher folk of Kerala and their culture and structure are authentic citations of Mathur (1977) in expositing the vulnerability of the fishers of Malabar.

Kurien"s (1995) apprehension is linked to the fisher"s socio economics in terms of income, land holdings, housing quality, health conditions and literacy levels to that of the fishery development imperatives and its contribution to fisheries sector to state domestic product. Though the domestic product increases the standard of living of the community goes in the

11

reverse direction in comparison with the people working in other sectors of the state. Rajasenan and Paul (2012) highlight that globalization connected technological advancement and increased productivity gains in the sector was result of the intensification of fishing in the virgin biomass soon it led to an upheaval in the form of biological and economic over fishing, which in turn leads to the tragedy of the commons and thereby aggravating the livelihood issues of the fisher folk. Kurien (2000), shows that in certain areas of the state the use of kattumaram necessitates fishermen to use their children in the occupation at an earlier age for operating it with skill when they enter into the labour force in full-fledged level. The negative externality associate with this type of entry into the labour force in way is preventing their opportunity to attain literacy and schooling. Other living environment of the fishing community also prevents the fishing community to study and hence exhibits high dropout rates (Thomas, 1989). Colonized pattern of living in the coastal belt are characterized by intra-community conflicts Kurien (1995) and because of the specific pattern of dwelling the health condition of the fisher folk is also pathetically low (Kurien, 2005). Fishermen cooperatives would in turn help to necessitate the need for close cooperation among the government agencies and fishermen for developing a close-knit system for sustainable fishery management in the state (Rajasenan and Parvathy, 2012; Rajasenan 2015) illumines the employment threat and resource implications and possible conflicts in the fishing sector under the aegis of the deep sea fishing Meenakumari Commission Report (2015) submitted to the Central Government. Rajasenan and Paul (2012) show the socio-economic sustainability and ecological sustainability implications of the fisheries sector in Kerala and identify that seasonal trawl-ban is not enough to protect the sector so as to ensure livelihood security to the fishing community. In fact trawl-ban has had severe impact on the livelihood of the mechanized fishers. Rajasenan (2006) tries to address the exigencies of management regulation in terms of income, unemployment and food insecurity in the fish economy of Kerala and its impact to the fishers.

1.5.2   Employment

Visible change in the pattern of employment is seen in the globalised fishery economy of Kerala. Globalisation has generated externalities of both positive and negative, positive in the sense that it has increased indirect employment but negativity implies that core fishing sector employment of the traditional fishers has decreased. Capital intensity due to mechanization has also changed the character of employment; though a major part of the real fishers have been

absorbed into the system (Sathyadhas, 2009). But there are scopes to increase employment opportunities in the secondary and tertiary sectors of fisheries in view of the globalization of the economy. This can be augured well with more functional awareness and education linked to acquire more skill in doing allied fishing activities (Kurien, 1988). His explanation of three fold strategies to generate more employment and income in the fisheries sector is useful in initiating institutional and technological changes, which in turn has resulted in greater labour absorption at lower capital and recurring cost; creation of community social asset helps to generate employment in construction and maintenance; and finally activities for adding greater value to fish at the village level. Sticky labour is the main reason for the increasing population pressure on the coastal belts. In this changed process fisherwomen have the greatest impact in Kerala fisheries. All these resultant process of change according to Kumar (1999) has led to a new labour process resulting in high marginalization of the traditional fishers. Rajasenan (2015) explains the new climate induced livelihood and employment changes of the fishing community and its impact in the fish economy of Kerala and suggests coping up strategies in the sector to address employment issues of the fishing community.

1.5.3 Food Security and Fisheries

Increasing importance of fish in common man‟s diet is an established fact and this is particularly focusable in a country like India with extensive coastal area in meeting the food and nutritional security to the fish eating population. It is worthy to note that in the state fish accounts for over three-quarter of the animal protein intake. There is high fish consumption rate among fisher folk in the state. Fish has become a culturally important and vital part of Keralites diet (Kurien, 2000). Some species like sardine and mackerel are considered to be poor man‟s protein and hence works wonders in alleviating malnutrition (Kent, 1985). The idea of „food security‟ is a challenging goal to achieve, and the contribution of fisheries to human food supply is specifically important (Kent, 1997). This is to be estimated on the basis of fish production, which again is used for human diet or for animal feed or fertilizer. Based on three specific aspects on the importance of fish for food security and nutrition it is to be evaluated with respect to; the protein and nutrient content of fish as food, the role of fisheries and aquaculture activities as a source of income and livelihood and the relative efficiency of fish to produce/transform proteins (HLPE, 2014).

Because of export orientation and increasing demand base for fish products the per-capita consumption according to Ibrahim (1992) in the state has been declining since 1957. High technological development in the fishing sector has also helped to develop long supply chains, which in turn affects local consumption, particularly consumption of the fisher folk. Galtung‟s (1984) work explains that about 50 percent of the sardine was consumed locally in 1956 and subsequently this cheap fish moved to distant market and even outside the state. The proportion of assessed marine fish stocks fished within biologically sustainable shows a decline from 90 percent in 1974 to 71.2 percent in 2011, when 28.8 percent of fish stocks were estimated as fished biologically unsustainable level (FAO, 2014). Food security, in its four dimensions: availability, accessibility, utilization and stability, invites to a better questioning of the three dimensions of sustainability: environmental, economic and social. This needs proper planning and programme implementation so as to have clear strategy as „fish is strikingly missing from strategies for reduction of micronutrient deficiency, precisely where it could potentially have the largest impact‟ (Allison, et.al, 2013). It is required to modify the socio-economic perspectives and development alternatives of the fish producing developing countries to livelihood and food security rather than export orientation lest it enhances pressure to resources and threat to local food security (World Bank, 2013).

1.6 Conceptual Framework

The conceptual framework of the study is illustrated in Figure 1.1 Globalization and the allied developments in the fisheries sector created an array of sub-sectors ultimately resulting in a situation of "too many vessels chasing too few fish". This created multifaceted issues like resource depletion, seasonality, variation in catch, shift in landing centres, etc. which directly impacted the income, livelihood and food security of the fisher folk and also resulted in problems like low asset creation, lack of skill, low living standards and debt burden. A recent impact to the fishery is the climate change induced fishing issues. This has high implications in the traditional fishery and traditional fishery based pelagic fish species like sardine and mackerel as these species are seemed to be disappearing in the coastal waters or have a north-ward drift. The result of this has been poverty and social exclusion. The process continued like a vicious nexus involving poverty, exclusion, livelihood issues, lack of skills and assets, etc. While the trawl ban assisted in curbing resource depletion to a certain extent, its impact on the livelihood of fisher folks was visible. Large number of vessels and its operation has also changed fishing operation

systems of specified nature and this even prevents fishing operation of other region vessels. This may also have some specific craft-gear combinations in one fishing area to another and even restrictions in fishing in other areas in the coast. This system is akin to community based fishery management system operated in the fishery as in „padu" systems.

Figure 1.1 Conceptual Frameworks

1.7   Objectives

The main objective of the study is to evaluate the socio economics of fisher folks of Kerala in terms of livelihood and food security. The sub objectives include:

➢ To study the socio economics and family status of the fishing community.
➢ To evaluate the dynamics of the fishing sector in terms of output changes and its impact in the socio economics of the fishers in an inter-temporal sub-sectoral development scenarios.
➢ To study the impact of trawl ban on the livelihood and employment changes and food security of the fisher folks.
➢ To probe into the effectiveness of government policies in Livelihood enhancement and poverty alleviation among the fisher folks.

1.8   Research Questions/Hypotheses

• How sectoral and sub-sectoral changes affect the socio economics and family status of the fishing community?

- Are there any alternative employment augmentation activities in the fishing sector to overcome the issues of seasonal, perennial and trawl-ban related employment problems?
- Does trawl-ban lead to more impacts to fisherwomen than fishermen?

1.9   Universe

The sampling frame of the study will be the fisher folks in twelve fishing villages of Kerala. Universe of the primary survey is the fisher folk in the 222 fishing villages of Kerala encompassing three fishing zones. Multi-stage stratified random sampling method will be employed in the study. Primary data will be collected through structured interview schedules. The data collection also includes participatory approaches in the form of discussions with focus groups. Simultaneously, along with the sample survey, standard of living of the fisher folk will also be captured and a Standard of Living Index (SLI) will be worked out in inter-temporal levels as part of the socio economics and family status analysis.

1.10   Unit

The unit of observation is the fisher folk households in the three coastal districts of Kerala with very high mechanized fishing concentration like Kollam, Ernakulam and Kozhikode.

1.11   Methodology

Fishers in the fishing villages of the state has been divided into of three zones viz. North Zone, Central Zone and South Zone constituting three coastal districts viz. Kozhikode in the North Zone, Ernakulam in the Central Zone and Kollam in the South Zone have been selected for primary survey. Four coastal villages, from each district, are selected and from each village 25 households will be surveyed, thus constituting a total of 300 households. Detailed sample design is depicted in Figure 1.2. Secondary data relating to employment and income as part of the socio-economic and family status analysis of the households are also collected from of records and information from magazines, journals, published articles, newspapers, published thesis, unpublished data from research institutions, internet sources etc. Records and reports have been collected from various Government Departments like the Matsyafed, Fisheries Department, Central Marine Fisheries Research Institute (CMFRI), South Indian Federation of Fishermen Societies (SIFFS), Programme for Community Organization (PCO) and other NGO groups working in the fishing sector etc.

Figure 1.2 Sampling Design

Fisher folks	District	Fishing Villages
North Zone (100)	Kozhikode (100)	Puthiyappa N (25); Puthiyappa S (25)
		Beypore (25); Chaliyam (25)
Central Zone (100)	Ernakulam (100)	Njarakkal (25); Nayarambalam (25)
		Munambam (25); Malipuram (25)
South Zone (100)	Kollam (100)	Vady (25); Moodakkara (25)
		Shaktikulangara (25); Port Kollam (25)
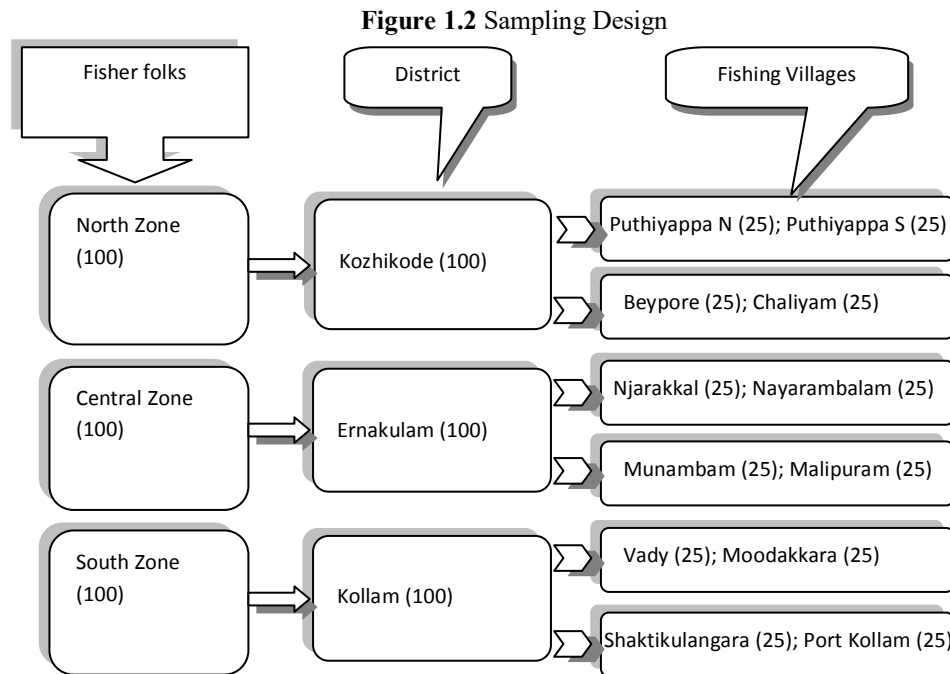
1.12 Data Analysis and Methods

Data are tabulated on the basis of socio-economic and household characteristics and also for analyzing differences in income, employment, poverty and inequality. Statistical methods like Chi-Square test, Correlation, and other basic descriptive and graphical methods have been used to analyse the data.

1.13 Scheme of the Study

The study is classified into five chapters with a clear logistic chain, starting with the basic concepts and ending with the conclusion and policy option. The first chapter sets the background and explains the research issue. It gives details on both theoretical and analytical methodology and review of literature. The second chapter tries to explain the temporal dynamics in the socio economics with the help of basic indicators shifts, which acts as a major stimulating factor for reshaping their socio economics and employment of the marine fishers of Kerala. The Chapter 2 also highlights the development shocks and output changes with sub-sectoral births and its demises and finally to its duality as part of the fishery dynamics of Kerala in terms of output, exigencies and policy interventions. Chapter 3 explains the socio-economic and demographic profiles, livelihood and living standards based on primary data. It also tries to analyse income, inequality and poverty of the fishing community. Chapter 4 analyzes the changes in employment, income and its vicissitudes during the trawl ban in the fishing sector with the help of primary

data. The Chapter also evaluates the current status of Kerala marine fisheries as well as the present government schemes based on the fisher's perception and case studies. Chapter 5 gives the basic conclusions in a snapshot form along with policy highlights.

Figure 1.3. Chapterisation Scheme

Impact of Trawl Ban on Employment and Food Security of the Fisher folks in Kerala: an Analysis in the Context of Globalization

Chapter 1 Introduction	Statement of the Problem, Background of the Study, Traditional fishery economy, Fish Economy of Kerala, Fishery System in Kerala, Crafts and gears operating in the Marine fisheries sector in Kerala, An Overview of Literature, Conceptual Framework, Objectives, Research Questions/Hypotheses, Methodology, Scheme of the Study
Chapter 2: Inter-temporal Dynamics in the Fisheries Sector	Basic Profile, Education, Household Living Standards, Assets, Occupational structure, Fisheries Development in Kerala, Sustainability Issues in Kerala Marine Fisheries
Chapter 3: Family Status and Socio economics of Fisher folks	Religion, Gender and Age, Marital Status and Relation, Educational Qualification, Activity, Living Conditions, Standard of Living Index (SLI), Assets and Membership Benefits, Livelihood and Income, Household Income and Expenditure, Financial Habits, Income Inequality, Poverty
Chapter 4: Fishers Perception and Livelihood and Employment Changes in the Globalised Fishery Scenario	Perception of the Fishers, Impact of Trawl Ban on Livelihood, Impact of Trawl Ban on Income, Poverty Impacts of Trawl Ban, SHG-Cooperative Linkages and Livelihood Security, The current status of Kerala Marine Fisheries: Fishers Perception Analysis, Perception of fisher folks about Government Schemes, Case Studies

Chapter 5
Conclusions and Policy Options

1.14   Profile of the Sample Area

The sample fishing villages in the three districts of Kollam, Ernakulam and Kozhikode are classified into four clusters from each district for data collection purposes and hence have 12 clusters. Clusters in this respect encompass two/three wards of the fishing village based Panchayaths. The basic details regarding this are illustrated with the aid of Table 1.4 and Figure 1.4. The input of Table 1.4 is from the Kerala Government Fisheries Statistics at a Glance (2015) and Kerala Coastal Area Development Corporation data.

Table 1.4. Fisheries Profile of Sample Districts

District	Coastline length (km)	Fishing villages	Fisher folks	Active fisher folks	% of active fishermen	Landings (MT)	Landings in Rs. Lakhs	Fishing villages surveyed
Kollam	37	27	92500	18561	20	72270	95537	✓ Vady ✓ Moodakkara ✓ Shaktikulangara ✓ Port Kollam
Ernakulam	46	21	72119	13230	18	95023	108415	✓ Njarakkal ✓ Nayarambalam ✓ Munambam ✓ Malippuram
Kozhikode	71	34	97987	21769	22	94740	117480	✓ Puthiyappa S ✓ Puthiyappa N ✓ Beypore ✓ Chaliyam

Source: Government of Kerala, 2015

The total fishers population of Kollam comes to 92500, of this 18561 (20 percent) are active fishers living across 37 kms in 27 marine fishing villages and thereby contributing 72270 MT of fish in terms of quantity and Rs. 95537 lakhs in value. The sample area profile as given in Table 1.4 for Kollam shows that the four fishing villages (Vady, Moodakkara, Shaktikulangara and Port Kollam) have 18446 fishers with 3546 households. Most of the households in the fishing villages are electrified (95 percent) with minor variation between and among the sample villages. These villages, other than Vady households have sanitary toilets at an average level of 95 percent and drinking water facility ranging from 77.56 percent to 93.70 percent for the four fishing villages. The coast line of Ernakulam compared to Kollam is more with 46 kms but has less fishers than Kollam (72119) which is distributed across 21 marine fishing villages generating an output of 95023 MT and fetching a value of Rs. 108415 lakhs (Figure 1.4). The sample villages (Njarakkal, Nayarambalam, Munambam, and Malipuram) have 26953 fishers living in 1705 households. But these villages show big differences with respect to electrification, toilet facilities and drinking water availability as 95.41 percent in the case of Munambam and 94.34 percent in Malipuram. Whereas, the households that are having toilet facilities is comparatively less in the case of Njarakkal and Nayarambalam. Availability of drinking water compared to Kollam is less and it is around 75 percent in these four villages. Among the three coastal districts selected as sample, Kozhikode has the highest coastline of 71 kms and also the number of marine fishing villages (34).

Figure 1.4 Sample District Profile

Kerala

Kozhikode
Fishing Villages

	Bepore	Chaliyam	Puthiyappa N	Puthiyappa S
Households	711	1325	916	2054
Pucca	23.76	36.20	50.81	68.25
Semi-Pucca	66.51	52.57	42.56	30.25
Kutcha	9.73	11.24	6.63	1.50
sanitary toilets	93.94	96.55	97.67	97.00
Safe drinking water	76.71	85.47	80.23	82.60
Electrification	97.29	95.02	98.02	98.50

Ernakulam
Fishing Villages

	Njarackal	Nayarambalam	Munambam	Malippuram
Households	518	477	425	285
Pucca	13.64	25.00	65.31	9.44
Semi-Pucca	64.09	53.86	23.47	69.43
Kutcha	22.27	21.14	11.22	21.13
sanitary toilets	80.68	81.14	95.41	94.34
Safe drinking water	78.18	82.50	82.14	83.77
Electrification	85.23	83.41	96.94	99.25

Kollam
Fishing Villages

	Vady	Moodakkara	Shakthikulangara	Port Kollam
Households	455	359	1627	1105
Pucca	18.44	59.15	45.12	16.91
Semi-Pucca	77.78	36.34	53.58	81.82
Kutcha	3.78	4.51	1.30	1.27
sanitary toilets	77.78	97.18	97.41	96.36
Safe drinking water	77.56	73.80	93.70	89.82
Electrification	100.00	95.77	97.78	100.00

Source: KSCADC, 2016

Kozhikode has 97987 fishers, out of which 21769 are active fishers begetting an output of 94740 MT, and thereby contributing Rs. 117480 lakhs from fishing. The Kozhikode sample villages have (Chaliyam, Beypore, Puthiyappa South and Puthiyappa North) 5006 households with 16080 fishers and these households electrification status and sanitary toilet facilities are better than (more than 95 percent) the sample fishing villages of the other two districts of Kollam and Ernakulam. Barring Beypore (77 percent), safe drinking water is not a problem in the other fishing villages of Kozhikode.

20

Chapter 2

Inter-temporal Dynamics in the Fisheries Sector

Temporal fisheries development though started with the INP in the mid fifties, it has given rise to several imminent sub-sectors based on technological development with changed output contributions and thereby giving rise to significant livelihood changes. The major shift in employment happened in the first phase of globalization (fishing sector of Kerala is a highly globalised sector even before the opening up of the Indian economy in the becoming of the 90s) is the change in the labour process, the owners become workers working on share of proceeds basis but with an increase in indirect employment and hence the fishers also joined happily in the beginning. The mid-temporal-phase of the first globalised part is an output boom period giving rise to unprecedented gain to the investors connected to the new fortune from the export sector, leaving some marginal benefits to the real fishers. Hence the Kerala fishery economy witnessed a counter revolution in the form of motorization for survival. But the real globalization of the Indian economy has its own reverberations in the fishing sector with visible vicissitudes of resource depletion, drastic reduction in fishery production, new deep sea fishing policy shifts, joint-venture policy shifts, national wide fishery workers struggle for livelihood etc. The second temporal fishery period has marked with regulation and control with a policy shift favoring trawling ban with heavy protest from the mechanized faction and finally culminated this into a policy framework accepted by all as it is required to overcome total depletion and stagnation in the fishing sector.

The temporal dynamics of the fishing sector is delved into technology-output-employment-income changes and its associated shifts in the contour of fishers" socio economics and livelihood changes. For this end in view, Chapter 2 is disentangled into two sections. Section I delineates the temporal dynamics in the socio economics with the help of basic indicators shifts, which acts as a major stimulating factor for reshaping their socio economics and employment of the marine fishers of Kerala. Section II highlights the development shocks and output changes with sub-sectoral births and its demises and finally to its duality as part of the fishery dynamics of Kerala in terms of output, exigencies and policy interventions Hence, Chapter 2 is mostly blended with secondary information.

<div align="center">**Section I**</div>

<div align="center">**Temporal Dynamics in Socio Economics**</div>

This section throws light into the demographic and socio-economic domain of the marine fishers on a temporal basis with the aid of secondary data. This is done with the data amassed from the Socio-Techno Economic Survey of Fisher folks of Kerala, Marine Fisheries Census data and other published and unpublished data from the Department of Fisheries, Government of India and Kerala.

2.1   Basic Profile

The change in the basic profile of the marine fisheries sector of Kerala is elucidated for the period 1980-2016 in Table 2.1. It is clear that even the fishers households itself varied with an increase then to a decrease as it is increased from 99894 in 1980 to 120486 in 2005 and further declined to 118937 in 2010. But the notable thing in this household dynamics is the downward change in the average family size (from 6.41 percent to 5.13 percent) during the period and hence showing identical trend pattern family size of Kerala. Though the number of fishers households show zigzag variation, the number of active fishermen in the same period shows an increasing nature as from 131101 in 1980 to 140222 in 2005 and further to 145396 in 2010.

Table 2.1. Comparison of fishermen profile 1980, 2005 and 2010

Community	1980	2005	2010
No of fisherman households	99894	120486	118937
Fisherman Population	639872	602234	610165
Family size	6.41	5.00	5.13
Active fishermen			
full time	111970	124103	130922
Part time	11017	10488	10582
Occasional/fish seed collection	8114	5631	3892
Total	131101	140222	145396

Source: Marine Fisheries Census, 2005 and 2010

The percentage share of fishers population in the marine sector by age category given in Table 2.2 shows that the population window for the fishermen community is favorable as most of them are in the working age group. However, compared to 1984 statistics, the percentage of fishers below 15 years has come down from nearly 35 percent to 20 percent and then increased marginally to 22.3 percent in 2012.

Table 2.2. Population by age (Percentage)

Age category	1984	2004	2012*
Below 15	34.79	20.11	22.3
15-59	59.53	74.13	64.8
60 and above	5.68	5.76	12.9
Total	100.00	100.00	100.0

Source: Department of Fisheries, 1990, 2005;
*CSSEIP Survey data, 2012

The religious category of the marine fishers (Table 2.3) does not show any alarming changes during 1984-2004. The percentage of Hindus has increased and Muslims has come down during 1984 and 2004 periods. However, comparing these with the 2010 data the Christian category has increased from around 35-36 percent to 43 percent in 2010.

Table 2.3. Religion (Percentage)

Religion	1984	2004	2010*
Hindu	33.16	36.90	29.00
Christian	36.01	35.10	43.00
Muslim	30.83	27.90	28.00
Others	0.00	0.10	0.00
Total	100.00	100.00	100.00

Source: Department of Fisheries, 1990, 2005; * Marine Fisheries Census, 2010

Table 2.4 shows the fishers based on social category. Though explicit data relating to this is unavailable during various time spans, one thing is obvious that majority of the marine fishers (88.2 percent) belongs to the OBC category. The proportion of the SCs and STs is only 2.5 percent compared to 2.7 percent during the 1984.

Table 2.4. Social Category (Percentage)

Category	1984	2004	2010*
SC	2.7	2.4	1.9
ST		0.1	
OBC	97.3	88.2	
Others		9.3	98.1
Total		100.0	100.0

Source: Department of Fisheries, 1990, 2005; *Marine Fisheries Census, 2010

The marital status of the marine fishers during the three periods as given in Table 2.5 shows a varying trend. 45 percent of the fishers are unmarried during 2004 compared to 59.57 percent. Those who are married have increased from 40 percent in 1980 to 51.9 percent in 2004 and

further to 53.25 percent and further reduced to 1.91 percent in 2012. Widowed/divorced and separated form 0.91 percent in 1980 compared to 3.1 percent in 2004 and reduced to 1.91 percent in 2012.

Table 2.5. Marital Status (Percentage)

Marital Status	1980			2004			2012*		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Unmarried	62.31	56.74	59.57	48.5	40.9	45.0	48.10	41.40	44.75
Married	37.45	41.66	39.52	49.9	54.2	51.9	50.20	56.30	53.25
Widowed	0.24	1.60	0.91	0.9	4.3	2.6	1.50	2.20	1.85
Divorced				0.4	0.5	0.2	0.10	0.00	0.05
Separated				0.3	0.1	0.3	0.10	0.10	0.10
Total	100	100	100	100.0	100.0	100.0	100.00	100.00	100.00

Source: Department of Fisheries, 1990, 2005; *CSSEIP Survey data, 2012

2.2 Education

The spurt that happened in the education sector in Kerala has also reflected in the education level of the fishers, particularly in the 2005 and 2010 data sets. The percentage fishers in each level of education shows that the fishers are concentrated more in the lower levels. A marked shift is identifiable as more and more are moving to primary and secondary levels. The literacy rate among the fishers is only 73 percent as per the 2010 data which is far below the state average (Table 2.6). The situation of the fishers in the urban and semi-urban regions of the state is also dismal compared to the mainstream. An evaluation of educational profile of the fishers in a temporal basis (for the three time periods) viz. 1980, 2005 and 2010 shows that from a staggering 77 percent in the 1980, the illiteracy rate has declined to 27 percent as per the 2010 statistics. There has been an overall increase in the percentage of fishers having an education of secondary and above from a mere 5 percent to 40 percent during the period. However, the last five years, i.e. from 2005 to 2010 data do not show any visible change in the educational profile of the marine fishers. Illiteracy among the fishers has more or less remained the same during the five years period. However, a change of illiteracy is more visible in the globalised era. This is also because of the importance given by the fishing community with respect to education. The major factor for this is the integration of the coastal economy with the mainframe with infrastructure and education institutions. The Church has also taken a positive role in educating the fishers by starting more institutions in the coastal belt. This helped a quantum jump in the initial period of globalization, but the dynamics of is waned in the 2005 with minor changes in above secondary levels.

Table 2.6. Educational Status

Parameters	1980		2005		2010	
	Number	% of total	Number	% of total	Number	% of total
Illiterate/unschooled	491218	77	163567	27	152620	27
Primary	119823	18	171470	29	182181	33
Secondary	23514	4	218704	36	186246	34
Above secondary	5317	1	48493	8	33833	6

CMFRI, 1980, 2005 and 2010

As per the 2005 Techno Economic Survey of Fisher folks in Kerala, only 2.8 percent of the total literates have technical or higher qualifications. Also, the dropout rate among the marine fishers is as high as 14.6 percent in 2004 compared to the general average of 1.15 percent. This has forced them to continue in the same work and also in the same area, popularly emulating to the concept of „sticky labour" which is incomparable with the mainstream, but shows linearity with tribes of Kerala. This forms as the basic hurdle for them to learn and earn with good employment so as to make a vertical movement from poverty.

2.3   Household Living Standards

The conditions of the houses together with its types explain the level of living of the fishers. Data show good improvement over the two decades. Compared to 2.1 percent during 1984, 29.9 percent of the fisher houses are in pucaa conditions or good conditions. However, still 21 percent of the fishers live in huts. Also it shows that 49.1 percent of the houses are in improvable condition. From 2004 to 2010 the housing condition shows tremendous improvement with 85 percent of the fishers have pucca houses (Table 2.7).

Table 2.7. Condition of House (Percentage)

	1984	2004	2010*
Pucca/Good	2.1	29.9	85.0
Semi-pucca	41.5	--	--
Kutcha/Improvable	27.8	49.1	15.0
Huts/bad	28.6	21.0	--
Total	100.0	100.0	100.0

Source: Department of Fisheries, 1990, 2005; * Marine Fisheries Census, 2010

Another area which shows high concern is the land possession of the fishers as their land possession shows high decline during 2004 compared to 1984. This shows that about 75 percent of the fishers have own land as per the 2004 data. However, on a temporal basis the household not possessing any land has increased from 10 percent to 25 percent and then further to 31 percent during 2009-10. Majority of the fishers come under the category of owning 6-10 cents (48.79 percent) as per 1984 has come down to 21.17 percent in 2004 and then to a slight

improvement in 2012 at 23.20 percent (Table 2.8). This shows that the fishers have land only for housing and other basic facilities as about 68 percent of the household come under less than 5 cents of land and mostly in the cadastral limit. Hence it is clear that non-fishing income of most of the fishers" household is negligible. Land in Kerala society has both intrinsic and status values as the land is very highly priced and also is a major asset, which has been considered as one of the major asset is still a distant dream for the marine fisher folks of Kerala. The colonized pattern of living with marginal land owning the land price boom has not become meaningful in the coastal belts.

Table 2.8. Possession of Land (Percentage)

	1984	2004	2012*
No land	9.92	25.35	26.9
upto 5 cents	40.43	39.37	42.5
6-10 cents	48.79	21.17	23.2
11-50 cents	29.11	13.15	7.4
51 and above	4.69	0.96	0.00

Source: Department of Fisheries, 1990, 2005; *CSSEIP Survey data, 2012

The data on drinking water source among the marine fishery households of Kerala shows that the situation has improved drastically in recent period (Table 2.9). In 1984 only 20.6 percent of the fishery household had such facility, and this is changed to 51.2 percent in 2004 with some small backward changes in 2012, because of data level compatibilities. Though drinking water availability is improved in most of the fishing localities, the potable water is still a dream in some localities and hence needs further improvement in the facility of getting safe drinking water to fishing community. This also creates health havoc in the coastal areas during monsoon and summer seasons.

Table 2.9. Drinking water facility (Percentage)

	1984	2004	2012*
Own	20.6	51.2	56.7
Neighbors	20.6	22.1	24.3
Common, Panchayath, etc.	58.8	26.7	19.0
Total	100	100.0	100.0

Source: Department of Fisheries, 1990, 2005; *CSSEIP Survey data, 2012

1984 data show that 81.2 percent of the fishery households had no latrine facilities as they had the habit of using the beach for this purpose. But the situation has improved phenomenally in 2004 as it has reduced to 11 percent and further to 8.4 percent in 2012. This has happened with two fold efforts taken by the government and other NGOs connected with the fishing sector, first is through measures to enlighten them the need and importance and second

through financial help by the government (Table 2.10). However, the condition and usability of these latrines is still a concern.

Table 2.10. Latrine Facility (Percentage)

	1984	2004	2012*
Own	14.6	85.0	89.0
Common	4.2	4.0	2.6
No facility	81.2	11.0	8.4
Total	100.0	100.0	100.0

Source: Department of Fisheries, 1990, 2005; *CSSEIP Survey data, 2012

2.4   Assets

The asset holding among the fisher folks during 2004 is very poor compared to the nature of its holding of various social classes in Kerala.

Table 2.11. Household Ownership of Assets (Percentage)

Household Amenities	2004	2012
News Paper	13.8	22.3
TV	35.6	85.2
Radio	24.9	18.0
Fridge	6.6	10.2
Mixer	13.8	28.1
Washing Machine	0.7	1.2
Telephone	10	6.9
Mobile Phone	2.8	78.2
Computer	0.3	-
Household Equipments	2004	2012
Bicycle	4.14	12.2
Two wheeler	1.05	8.2
Auto	0.2	0.0
Pickup auto	0.11	0.5
Car	0.04	0.1
Mini van	0.05	-
Lorry	0.01	-
Other vehicles	0.06	-
Craft Types	2004	2012
Kattamarom	1.61	Traditional: 2.20;
Kettuvallom	3.11	
Playwood vallom	2.79	
Fibre glass vallom	1.29	
Murivallom	0.74	
Thnguvallom	0.14	Motorised: 10.90;
Ottathadi vallom	1.5	
Choonda vallom	0.12	
Inborad vallom	0.33	Mechanised: 0.95
Others	1.35	
Total	12.99	14.05

Source: Department of Fisheries, 1990, 2005; CSSEIP Survey data, 2012

Only 13 percent of the fishermen household possesses fishing crafts (Table 2.11). Those having motor vehicles like two wheelers, car, van, etc. are also very less. TV is one of the major household equipments as 35 percent of the households have this facility. Household amenities improved significantly in 2012. But it is very difficult to identify the craft types based on the sample survey conducted by the CSSEIP (2012) and hence elicited information based on three categories of traditional, motorised and mechanized, with very predominance of motorised crafts percentage. Once the data pertaining to these aspects are known from the Techno Economic Survey (2015) conducted by the State Department of Fisheries (yet to be published), basic indicators dynamics gets more clarity.

2.5   Occupational structure

The occupational pattern of the fishers shows manifold changes with the advent of globalization in the marine fisheries sector as it begets several sub-sectors. Major activities of the fishers encompass pre-harvest, harvest and post-harvest activities. Among this the work and employment are mostly connected in the harvest sector in the three major areas of traditional, motorized and mechanized sectors. The actor-activity is well portrayed in Table 2.12.

Table 2.12. Major activities in the marine fisheries in Kerala

Activity	Actor
Traditional*	Include fishing labours, owners using artisanal crafts and gears.
Motorized*	Include fishing labours, owners using 28motorized crafts and gears. This sector emerged in the early 80"s.
Mechanised*	They include craft/boat owners, labourors working in mechanized units, etc.
Allied activities@	This sector includes those working in pre-harvest and post-harvest activities such as net making/repairing, fish vending, peeling, drying, etc.

Note: * sector employs only male fisher folk

@ Includes both men and women; all the fisherwomen are employed in this sector

Section II

Dynamics of Fisheries Sector Development

Marine fishing sector in Kerala based on its development rhythm and involvement is generally classified into six stages viz. Planning Phase (1951-60), The Export Oriented Phase (1961-70), Stagnation and Growth Phase (1971-80), The Phase of Transition (1981-90), Post-trawl Ban Period (1991-2000), and the Later Post-trawl Ban Period (2001 onwards).

2.6   Fisheries Development in Kerala

Post 1950s witnessed two drastic changes in the fishing sector of Kerala, first in the form of mechanization owing to the introduction of trawling and second is the automatic outcome engendered in the traditional fishing sector to fight against the ill-effects of trawling of the mechanized boats as a survival strategy. The mechanization of crafts started in the early 1950s (1953) under the aegis of the Indo-Norwegian Project (INP) in the Kollam area. The next in the series of this change was the introduction of nylon webbings supplants cotton webbings in the 1960s. The third in the series is the technological process connected to purse-seining in the late 1970s. All the three stages had been espoused in the mechanized sector. The fourth stage was anointed for the development and livelihood of the traditional fishing sector in the form of large scale motorization of the country crafts in the 1980s. The fishing sector in Kerala was not capable of absorbing these rampant ramifications and hence witnessed abnormal resource depletion and sustainable impacts and hence this period witnessed formation of fishermen's unions and the beginning of struggles for livelihood and appointment of commissions after commissions to tide over the mounting unrest in the middle of 1980s. Starting with the end of 1980s (in 1988) the 1990s saw the period of regulatory regime in the fishing sector. The latest in the series was the initiation phase of the formal and informal institutional linkages in Kerala fisheries in the 2000s.

2.6.1   Initiating the Planning Phase

The planning phase started with the first five year plan. This was kick started in the year 1953 in the form of mechanisation with tri-partite agreement assistance under the auspices of the Indo Norwegian Project (INP) with the intention of mechanizing the fishing vessels of Kerala with prolific technical assistance from the naval architects associated with the Food and Agricultural Organisation (FAO) [Korakandy (1987)]. This almost worked for a decade until 1963 when the FAO completed the process of mechanization of fishing boats.

2.6.1.1 Indo-Norwegian Project and Mechanisation effort 1953

The project aimed for developing a fishing port and using mechanized boats to fish in the deeper waters of the sea. The main objective was to extend technical assistance in the form of machinery, aid and expertise to the so called "underdeveloped economies" (Kurien, 1985). Under this project, the Government of Norway will "assist the Government of India in carrying out a

programme of developmental projects to contribute to the furtherance of the economic and social welfare of the people of India" (Gerhardsen, 1958). The Indian Government acceptance was endorsed in the form of publicized Community Development Programme with the objectives as per Box 2.1, which was derived based on the consensus between the development agenda of Norway, Central Government and the then Government of Travancore-Cochin.

Box 2.1 Objectives of the INP

- *An increase in the return of fishermen's activity;*
- *An efficient distribution of fresh fish and improvement of fishing;*
- *An improvement of the health and sanitary conditions of the fishing population; and*
- *A higher standard of living for the community in the project area.*

Source: Kurien, 1985

Though there are several specific objectives in the project, the major idea behind this to improve the fishing methods. Based on this agenda the INP started its work giving new shapes to the craft without much change to the fishing gears (Kocherry, 2000). The project area by and large was hovered around the fishing villages of Sakthikulangara and Neendakara in Kollam district. Instead of making any innovations to the existing crafts, with the help of the imported designs from Norway it started constructing a series of mechanized boats in the Neendakara (Directorate of Fisheries, 1969). Along with this requisite infrastructure for such a venture had also been developed in the project area which includes boat yard and workshop designed to build and maintain mechanized boats, a fishery education and gear development centre, health centre, refrigeration plant and pipe factory and several marketing schemes (Gerhardsen, 1958). All these helped for a radical transformation of the small traditional fishing village into an advanced fishing centre capable of generating lucrative vast export markets for shrimps (Saxena, 1970). Along with this the lure for profit attracted capitalists and private entrepreneurs into the seafood export sector. Here comes the euphoria for investment in mechanised boats showing the tendency of capitalistic exploitation and thereby changing the very structure of the fishers into wage earners. Further ramification that happened in the fishing area showed that the gainers were mainly non-fishing community by providing miniscule to the real fishers and hence the fishing sector manifested the penumbra of „the tragedy of the commons".

Plan-wise feature showed that the first five year plan marked planned development of the marine fisheries sector in Kerala, but the fish output showed a declining trend of 91 percent. However, the second plan helped to recover this to a greater extent of 69 percent. Oil sardines

and mackerels were the main economic species caught during the period mostly by the artisanal fishers using their non-mechanized wooden craft and traditional cotton nets or hooks. The marine fish production of Kerala and its percentage change during 1950 to 1960 is shown in Figure 2.1. The year 1955 marked the lowest fish production of 105457 tons and year 1960 marked the highest fish landing of 344605 tons. By the end of the decade marine fish landings in the state as a whole showed an overall increase of 70 percent, i.e. from 202047 tons to 344605 tons. The entire harvest was the result of the efforts of the artisanal fishermen of the state.

Figure 2.1. Marine Fish Landings during 1950-60
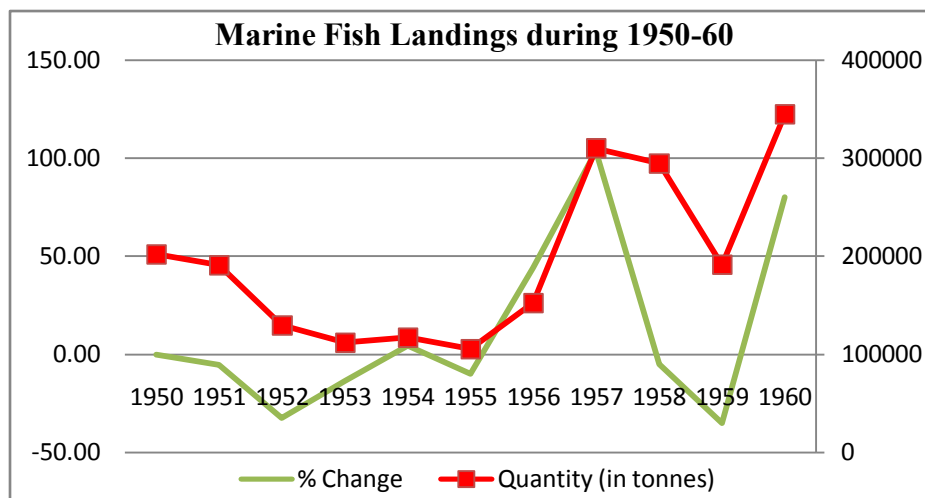
Source: Worked out from Appendix 2.1

In 1957-58 it was estimated that there were 42,039 fishermen households in Kerala comprising of 269,064 fishers. They operated 8,280 kattumarams, 3,173 plank canoes and 8,774 dugout canoes. The combined total of the fishing nets were 61,560, out of with 16,000 are hook and line sets. These were operated by 66,000 fishers producing an output per-worker around 4,500 kg per-annum. This could help to generate   an average household income of Rs 542 per-annum giving rise to an average debt of Rs 322 per-annum(Kurien, 1985).

2.6.2   The Export Oriented Phase

The decade 1961-70 was considered as the period of shift from fish for local consumption to fish for export with specific species target for fishing operations. This shows marked shift in the fishing policy of welfare to the fishers and nutrition requirement to the local community to foreign exchange earnings from fishing. During this period about 84 percent (Rs. 92 million) was spent for fisheries development favouring the mechanised fishery. Though technological change was garnered with the intention of bringing the artisanal fishers to the modernisation process, it

turned into a sector giving increasing immiseration to the real fishers. Soon the sector transformed from subsistence oriented with traditional means of production to investment oriented benefiting a few and endangering the majority. Hence it started the beginning of a dualism in the form of "modern sector" and the "traditional sector". The institutional development mechanism, in fact, made a shift favoring the mechanized group as they have money power and lobbying power. Employment-wise the mechanized sector average employment for about 7,800 fishermen, whereas in the traditional sector it is a livelihood option for about 90,600 fishermen operating in the traditional sector. The increase in the fish production and its concomitant exports based on the mechanized sector is in no way useful dynamics when we evaluate the livelihood of the traditional fishers. A sector which was far beyond the mainstream in terms of socio economics was quickly breaking down traditional barriers of entry. The export-oriented growth and prawn target fishing got further boost with the devaluation of the rupee in mid-1966. Marine fish landings during the decade 1961-70 are depicted in Figure 2.2. The decade started with a significant fall in the fish production compared to 1960 and the lowest fish production of 191421 tonnes was recorded in the year 1962. The sector recovered significantly in 1963 and 1964. Though the INP came to an end, the changes that happened in the INP area soon became a development agenda in the fishing sector of the state. The fish output showed an increase in the mid of the export oriented decade. This shows that the technical changes in the fishing sector happened solely for export orientation of shrimp with heavy doses of capital for harvest technology in the form of investment in mechanised fishing units.

Figure 2.2. Marine Fish Landings during 1961-70
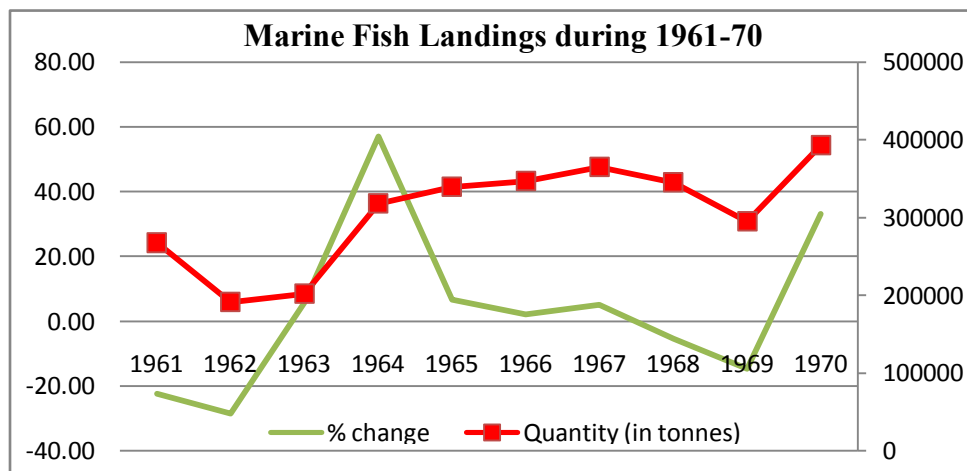
Source: Worked out from Appendix 2.1

2.6.3 Stagnation and Growth Phase

This phase seemed to be the one which witnessed heavy fall and high recuperation in fish production. This is also to be evaluated in relation to the investment spurt owing to heavy mechanization of small trawlers (for harvesting prawns) and purse-seiners (for harvesting oil sardines and mackerels). This period also witnessed an increase in the employment ratio (mostly in the export related sectors), though it resulted in a drop in physical ratio. Per-capita income in current prices increased because of the exponential increase in the rise in fish prices as a result of the increased demand for fish as a result of heavy remittances from the Gulf countries as well as increased demand for prawn in the global markets. Another change noticed in this period is the increase in the fishing assets of the artisanal fishermen and this is mainly to recoup the reduction in their output from fishing. It also led to procurement of more gears in the artisanal sector. The largest percent decline in output (28.85 percent) is noticed in this period as well, though more and more crafts and gears have been introduced into fishing. The fish production trend of 1971-80 is shown in the Figure 2.3.

Figure 2.3. Marine Fish Landings during 1971-80
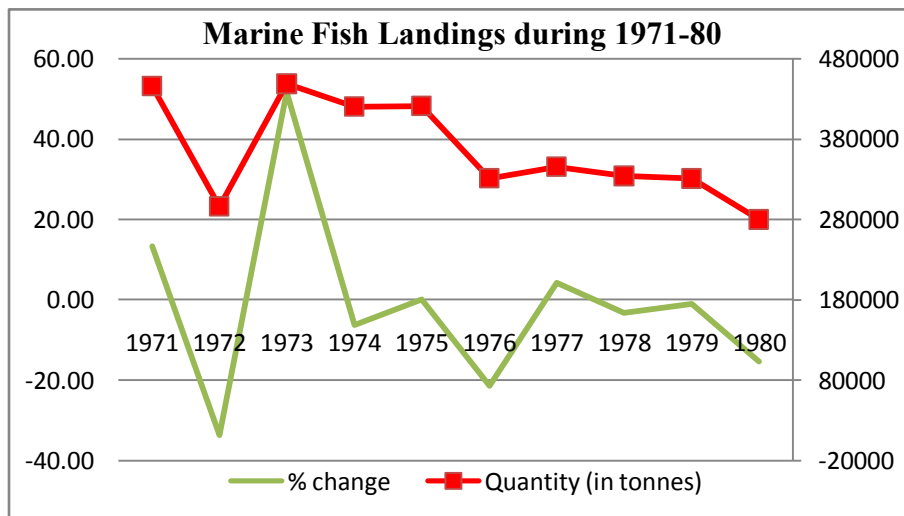
Source: Worked out from Appendix 2.1

The production change that happened in the traditional sector is more obvious as it declined to an all time low of 51.70 percent in 1980. The overall output also showed identical shifts of downfall from nearly 90 percent in 1971 to 50 percent in 1980. This is depicted in Figure 2.4.

Figure 2.4. Share of Traditional and Mechanized sector in Catch during 1971-80

☐ % Share of Traditional Sector   ☐ % Share of Mechanised Sector
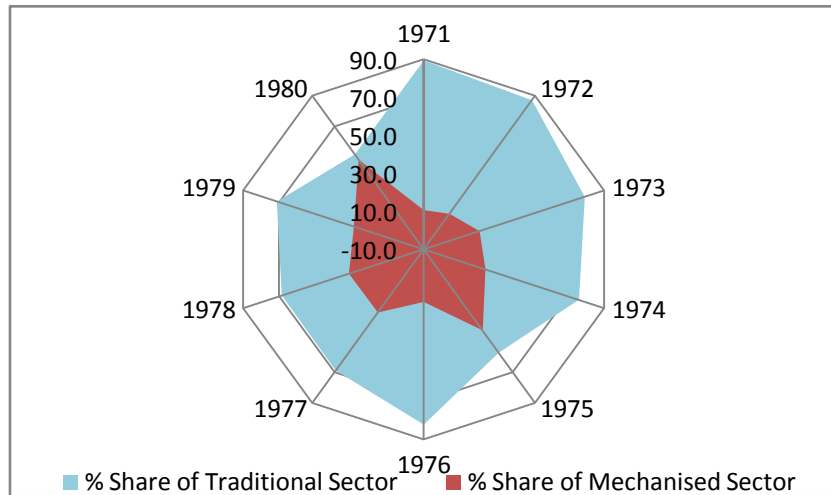
Source: Worked out from Appendix 2.2

Figure 2.5. Percentage share in Total Catch 1974-84

	Oil sardine	Mackeral	Prawns	Others
☐ Kollam	7.6	10.7	64.2	47.0
☐ Alappuzha	25.2	13.8	9.0	16.7
☐ Ernakulam	18.3	32.1	15.1	19.5
☐ Thrissur	12.7	9.9	2.3	4.0
☐ Malappuram	11.2	9.6	3.0	5.2
☐ Kozhikode	25.0	23.9	6.5	7.6
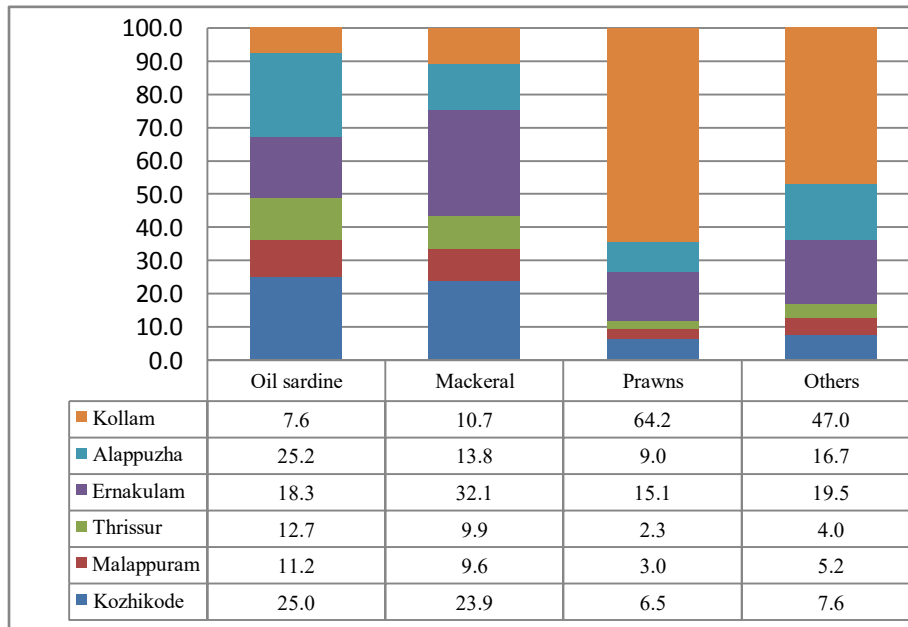
Source: Worked out from Appendix 2.3

The situation of stagnation though all pervasive, it is more seen in the case of some important species (from the yearly average) during 1975-79 the overall decline has come down to the level of 22.5 percent during the period. However, district-wise scrutiny of the species-wise percentage share of catch shows a marked difference (Figure 2.5) which is an indicative of the difference in the mechanization process across districts. The data during the period 1974-84 evince a decline in the relative share in northern districts mostly in terms of high valued varieties

(prawns and others) of fish caught by the mechanized boats. This shows that Kollam district outperforms the other five districts in terms of commercially important species, followed by Ernakulam. This is because the mechanization process that charged in the Kollam district has generated high power in Ernakulam too but its power circuit waned in the northern districts like Kozhikode and Malappuram with respect to output changes.

2.6.4 Motorization Effort

The anti-climax of the mechanization in the fishing sector has stated in the 1980s particularly by the traditional fishers in the form of rapid motorization of indigenous crafts by fixing outboard motors. The immediate impetus is the rapid fall of the traditional fish output.

Figure 2.6. Marine Fish Landings during 1981-90
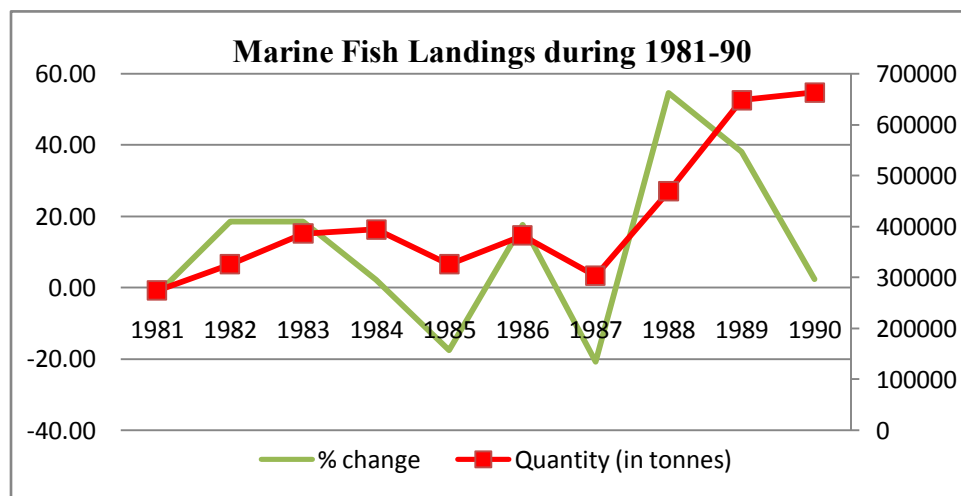
Source: Worked out from Appendix 2.4

The effort for such an endeavor was mooted initially by the Marianadu Malsya Ulpadaka Cooperative Society (MMUCS) in Thiruvananthapuram in 1974 to motorize kattumarams. This and changed gears helped fishers to increase fish production (Balan, 1998). Soon it became a new process of the traditional fishers to compete with the mechanized crafts. This process also helped in creating a new fishing class known as mechanized sector and also sub-sector as „motorized sector". This and other things helped to overcome stagnation and in a way the decade moved to a recovery stage of output. The initial advantages triggered large scale motorization which paved the way for a total eclipse of the non-motorized sector in the fishing sector and hence the resources are shared between motorized and mechanized units. During 1981-90 periods the marine fish landing of the state has increased from 274395 tons to 662890 tons, an increase of 141.58 percent. Based on growth trajectory this phase showed a clear dichotomy of

nominal rise of 18.64 percent in the fish production to a drastic growth of 103.63 percent. The fish landing trend during the decade is illustrated in Figure 2.6.

2.6.4.1 Fishers Agitation

Alarming resource depletion and reduction in catches of the traditional fishers and the resultant clear dichotomy of the fishing sector into motorised and mechanised have together with its realisation that the alien technology used by the mechanised sector has developed into a scenario of conflicts at sea and even at the shore. In the beginning, it started as fishermen agitations against the government for ban of trawling and area demarcation of the fishing zones for these separate fishing groups. However, violations of the fishing zones had become common by either group as the mechanised groups ventured into the traditional area and traditional fishers too started fishing in the mechanised fishing area due to heavy depletion of the resources. It has quite often been reported as conflicts between the „privileged" and „under privileged" for access to resources. In this struggle for survival the traditional fisher"s action is for livelihood and sustainability of resources as it is their own only source of livelihood, whereas the mechanised sector"s action is for profit for their investment in the open access fishery. It is generally considered that three reasons are responsible for this endemic crisis in the fishing sector:

1. Bottom trawling damages fish eggs and larvae and disturb the nursery ground of fish.
2. The noise of the mechanised boats keeps off fish from the fishing grounds and the night time trawling damages nets of the artisanal fishermen (Klausen, 1964).
3. Trawling changes the turbidity of the sea and hence the fish shoals avoid the muddy sea and thereby escape the gears (Kurien and Mathew, 1982).

The conflict phase can well be classified into three as of collective action, resistance against mechanisation and ultimately ending with ban on trawling.

Phase I

The phase I began during the 1960-70s with animosity and increased tensions between the trawler workers and the traditional fishers. This originated with the risk of damage of gears as well as income loss of the traditional fishers as fishers of both the groups fish in the identical grounds for the identical species like the shrimps, because of its high value.

Phase II

The phase II saw a series of struggle and agitation during 1980-90 against the operation of mechanized crafts. Though the traditional fishers voiced their protest both to the central and the state governments, instead of solving their problem the governments were forced to mitigate the issue by appointing expert committees to study the issue. Even the expert committees appointed to study these issues initially was favoring both groups and hence became difficult for developing a clear solution to the fishing sector. Nonetheless the government owing to the pressure from the mechanized groups forced to shelve the report. However the agony of the fishers and unsustainable nature of the fishery continue which led to ignite the struggle further with the support of the church and NGOs working in the fishing sector.

Phase III

The phase III struggle during 1990s became a national issue for continued debate and discourse. This period saw the formation of the national-level fishers union akin to the one formed in the 1970s known as National fishermen and Fish Workers Union to press the fishers" problem. In some cases all the fishers irrespective of mechanized or traditional joined against joint ventures and deep-sea fishing policy of the government. In this way it was a mere survival and livelihood of the fishers and political and church backing to a certain extent the fishers succeed in gaining their right to fishing. But the issues of the mechanized and traditional continued unsolved in the fishing sector.

Collective action

In the mid seventies onwards Kerala fishing sector has been activated with plethora of fishers union and the resultant collective action meant for the fish and fishers of Kerala. Originally the union started mainly as social service societies in the district levels. This led to the formation of Kerala Latin Catholic Fishermen Federation in 1977 by amalgamating the district level Latin Catholic Fishermen Unions. This also went for another change in 1980 with the Kerala Independent Fishermen Federation (KIFF). Here comes the development for the Hindu fishers union as All Kerala Dheevara Sabha. Further activation happened in this area is the unification of these unions with the name as Kerala Swathanthra Malsya Thozhilali Federation. This helped them to generate political and pressure tactics to achieve their goals. Soon the Kerala Swathanthra Malsya Thozhilali Federaton (Kerala Independent Fishworkers Federation) became

a unique movement in the fishing sector. It is a non-party trade union with community-based organisations, working in the unorganised sector of fisheries. This is affiliated to the National Fish Workers Forum (NFWF) as a federation. In 1978, 13 major regional fishermen unions met in Madras and set up a National Forum for k*attamaram* and country boat fishermen's rights and marine wealth for safe-guarding the right of the traditional fishers of India.

2.6.4.2 Resistance of artisanal fishermen towards mechanization

The Kerala Independent Fish Workers Federation‟s actions for the traditional fishers helped in persuading the authorities to take stringent policy measures for the welfare of the fishers by ensuring the sustainability of fishery resources. The clout of the traditional fishers through fishers union indeed forced the boat owners and operators to form their own associations to exert their power in the government. These two groups have emerged as powerful stakeholders and hence resulted in frequent clashes.

2.6.4.3 Government Intervention and Trawling Ban

The fishers started their demand first for the enforcement of the ‚Kerala Marine Fishing Regulation Act of 1980 (KMFRA) and then for the implementation of monsoon trawling ban with a view to protecting their livelihood. The prolonged struggle finally resulted in the implementation of regulative measures as illustrated in Box 2.2.

Box 2.2. Regulative Measures by the Government

- Restricting mechanized trawling beyond territorial waters
- Imposing ban on night trawling, purse seining, ring seining, pelagic trawling and mid water trawling
- Imposing temporarily a ban on monsoon trawling
- Enhancing the minimum mesh size of the cod end of trawls to 35 mm
- Motorization of artisanal crafts, etc.

The first committee appointed under the chairmanship of D. Babu Paul in 1981 failed to decide on the issue of monsoon trawling. But the continued agitations and demands from the traditional sector resulted in the formation of another expert committee under the chairmanship of A.G. Kalawar in 1984. Though the committee did not favour trawl ban during monsoon seasons, it endorsed several suggestions and several measures for the conservation and management of resources. As the issue of trawl ban demand becomes unending in the fishing sector another expert committee with the name Prof. N. Balakrishnan Nair was appointed by the government in 1987. The committee went for the favour of the traditional sector highlighting

resource depletion and its impact on traditional fishers" livelihood. This is well analysed with the help of Catch Per Unit Effort (CPEU) reduction *inter alia* alarming reduction in the prawn catch in particular. Ex-post realization of the fishery, the committee favoured a ban on trawling by mechanized vessels above 25 HP capacities during the monsoon seasons in 1988, an epoch making event in the fishery history of Kerala for resource sustainability and livelihood security of the real fishers, and in fact the first of such measure in the free independent India. The details of Expert Committees in this regard are shown in Box 2.3.

Box 2.3. List of Expert Committees

- Babu Paul Committee: 1981
- Kalawar Committee: 1984
- Balakrishnan Nair Committee I: 1987
- Balakrishnan Nair Committee II: 1989
- P.S.B.R James Committee: 1993
- Silas Committee: 1994
- Balakrishnan Nair Committee III: 2000
- D.K Singh Committee: 2006
- Expert Committee on Fish Wealth of Kerala: 2014

Subsequently, Kerala witnessed a series of expert committees like the Balakrishnan Nair committee II and III (1989, 2000), P.S.R James Committee in 1993 and Dr. E.G. Silas committee in 1994. The Silas committee recommended for zone demarcation of the traditional crafts of less than 15 HP and standardization of overpowered artisanal fishing gears like mini-trawls and ring-seines. The expert committee of D.K Singh in 2006 pointed out the extent of habitat destruction and hence recommended for uniform fishing ban along Kerala coast for 47 days. This is followed by the Seven Members Expert Committee on the Fish wealth of Kerala in 2014 under the Chairmanship of the Additional Director of Fisheries, Kerala. The terms of reference of the Committee is shown in Box 2.4.

Box 2.4. Major Terms of Reference of the Expert Committee to evaluate Fish wealth/ impact of Trawl Ban along Kerala Coast

1. Evaluate how far the monsoon trawl ban imposed along the Kerala Coast for the last 18 years was beneficial in sustaining fish wealth of the state.
2. Review the changes in fishing methods and practices and its influence in sustainability of resources.
3. Evaluate the length-power combinations of fishing vessels, suggested by the previous committees and offer practical recommendations.
4. Suggest administrative and regulatory measures for the sustainable development of fisheries in the state.

The committee suggested a vision statement for Kerala marine fishery as:

"To maintain in a sustainable manner the marine fishery yields from the presently exploited continental shelf of the state and to increase production through exploitation of deep sea resources"

The evaluation made by the committee connected with trawl ban imposed in Kerala since 1988 has identified the need to extend the trawl ban period from 45 days to 60 days in two periods each for 30 days i.e. June-July and October-November.

2.6.5 First Post Ban Period (First Decade of Globalization)

The catch data in the first ban period (1991-2000) showed moderate dynamics as the average value is 5572976 tons with a low-high range of 50727 to 6041113 tons (Figure 2.7). This shows an overall decline of 15 percent during the first post period.

Figure 2.7. Marine Fish Landings during 1991-2000
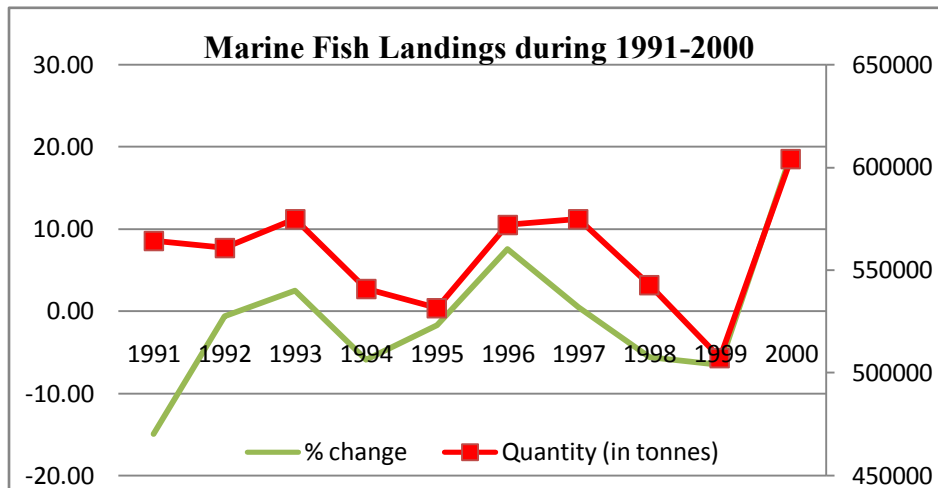
Source: Worked out from Appendix 2.1

2.6.6 Second Post Ban Period (Second Decade of Globalization)

The second post-ban period (2001-2013) shows an average of 600000 tons, the year 2012 registered the catch of 530638 tons. The oscillations of catch in this period were in the range of + or - 10 as depicted in Figure 2.8.

Figure 2.8. Marine Fish Landings during 2001-2014
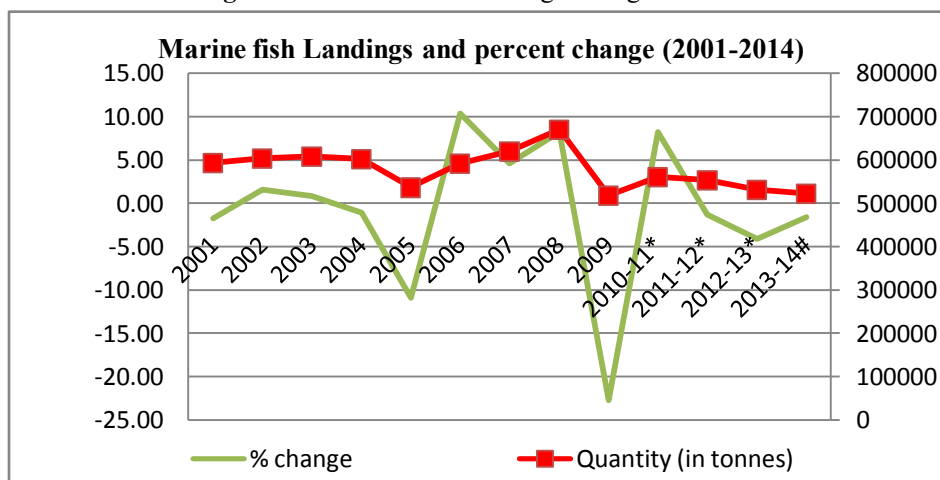
Source: Worked out from Appendix 2.1

2.7 Sustainability Issues in Kerala Marine Fisheries

2.7.1 Changes in Fishing Crafts

The counter-strategy of the traditional fishers against the challenges of the trawlers was through motorization.

Table 2.13. Fishing Crafts Operating in Kerala (No.s)

Sl.No.	Category	1988-89	1999-00	2002-03	2014-15
1	Mechanised	3548	4194	4510	4113
2	Motorised	9914	28829	29395	28222
3	Non-Motorised	20545	21751	21956	2306
	Total	34007	54774	55861	34641

Source: KSPB, 2015; Economic Review, 1989, 2000, 2003, 2015

The technological innovations resulted in capital intensity even in the traditional sector itself. The details of crafts and gears are given in Table 2.13. Number of crafts after 1988-89 showed an increase up to 2002-03, subsequently crafts in all sub-sectors showed a declining tendency with almost an eclipse of the non-motorised traditional sector. The major immediate implication originated in the form of fishing area shortage as these groups also started fishing in the identical fishing areas. This implied that the area per fisher folk declined from 17 hectares in 1960 to 6 hectares in 1990 and that of a boat declined from 59 hectares to 40 hectares.

Artisanal gears and resource depletion

From 1985 onwards the traditional sector also relied heavily on detrimental gears for fishery un-sustainability. One such gear is the ring seines which contributed lot of young fishes and juvenile prawn. These issues are reported at various areas of the traditional fishing centres in

Kerala. The implications of using the mini-trawls in the outboard motors have been equally harmful to the prawn fishery and all these might finally develop a situation of recruitment overfishing. The same impact in the fishery has also been reported in the boat-seines and shore-seines usages in the traditional fishing in Trivandrum (Menon and Pillai, 1996).

2.7.2   Overall evaluation of catch

Despite the trawl ban, the catch structure has visible oscillations, but has shown stationary trend hovering around 500000 tons. But the greatest hit is noticed in the traditional sector. Development of centralized landings centers though good in commercial sense has adverse livelihood implications for the locally embedded fish vendors especially women. The marine fish production during 1950-2014 (Figure 2.9) is a clear exemplification of stagnation after an initial spurt, which itself is a manifestation of over-exploitation and unsustainable fishery practices.

Figure 2.9. Marine Fish Landings during 1950-2014
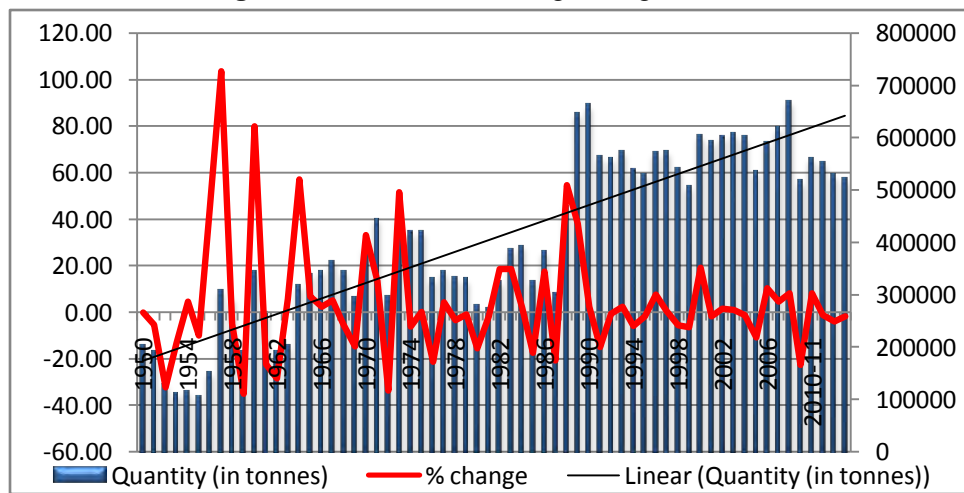
Source: Worked out from Appendix 2.1

The problem of fish landing was identified during the period 1973-87, a period of increasing effort resulting in reduced catch as catch data showed a decline from 448269 tons in 1973 to 303286 tons in 1987. Increasing fishing effort negated fecundity; spawning-recruitment process as with increasing application of trawling and purse-seining and also exponential expansion of the new fishing input in the form of motorization. Summing all of these generated a paradoxical situation of un-sustainability not only in terms of resources but in livelihood of the fishers. Though these un-sustainable fishing practices ended up in output reduction irrespective of pelagic or demersal species, the fall is worse in the case of demersal species. This is because

the chase during that period had been for demersal species with an eye for the export market (Rajasenan and Paul, 2012). But catch data show that it had exceeded 600000 tons in 1989 and 1990, this trend could not be sustained beyond 1990 as landings were maintained more or less near the MSY, irrespective of increased effort. However, trawl ban had shown positive impact in the fishery and this was visible only up to 1997. Subsequently the mechanized sector also has started showing negative impacts (Expert Committee on Fish Wealth of Kerala, 2014). This in a way exhibited period-wise differences in the average catch as given in Figure 2.10, which is a clear exposition of resource depletion.

Figure 2.10. Mean Catch 1950-2014
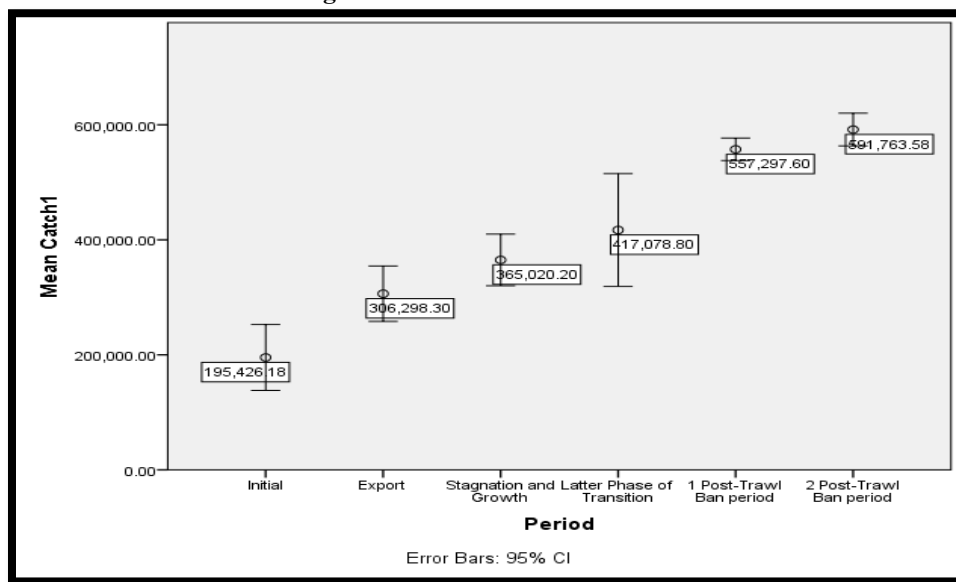
Source: Worked out from Appendix 2.1

Instead of period-wise canalization, it is also visible that the sub-sectoral shares in different periods have also shown identical impacts as depicted in Figure 2.11. Huge sector-wise variations in catch share have been identified during the three phase"s viz. slow modernization, rapid modernization and motorization with declining share of the traditional artisanal sector whereas the mechanized and motorized sectors witnessed an increase. Though there had been a marked increase in the fish production in the initial phase of the trawl ban, an in depth scrutiny shows a decline in the contribution of traditional sector. An automatic repercussion that generated in the fishing sector forced the traditional fishers for the introduction of outboard motors. This has also helped the traditional fishers with an increase in the output share from 38.4 percent in 1981-88 to 60.4 percent post-trawl ban. This implies that the post-trawl ban period helped an increase in the catch, but most of it was totally augmented in the motorized sectors.

Figure 2.11. Sector-wise Percentage Catch Share

	1956-59	1960-66	1967-75	1976-80	1981-88	1989-2013
■ Mechanised	0.0	4.0	16.0	31.0	30.5	30.2
■ Motorised	0.0	0.0	0.0	0.0	38.4	60.4
■ Traditional	100.0	96.0	84.0	69.0	31.1	9.4
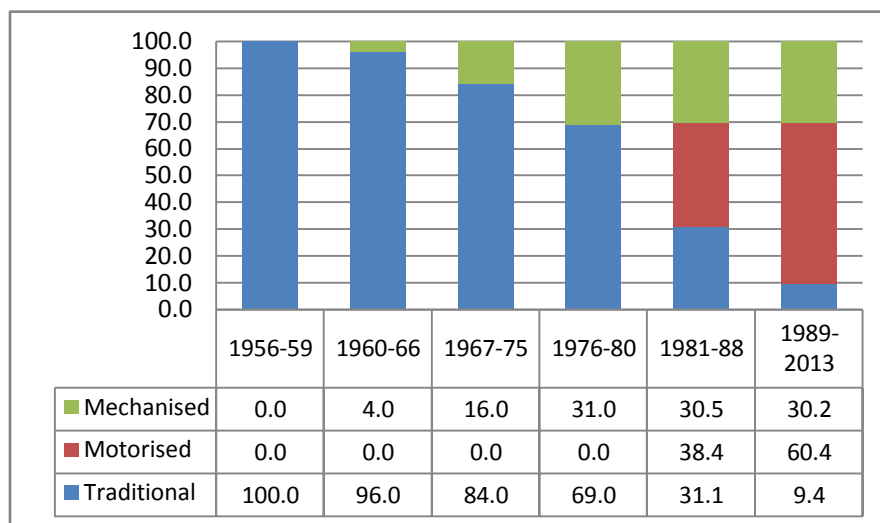
Source: Worked out from Appendix 2.4

2.7.3 Pre and Post Ban Period Catch and Sustainability Issues

Sustainability of catch structure is evaluated for the six periods of pre and post ban based on historical maximum on each phase. Analysis based on the historical catch, the sustainability status has improved compared to the pre-ban period based on percentage historical values as 0.45 and 0.56 during the three pre-ban periods and the overall catch structure however has shown a marked increase after the introduction of ban on trawling from 1988. Table 2.14 highlights this.

Table 2.14. Resource Depletion

Period	Historical Maximum	Mean	%Historical
Pre-ban 1 (1961-68)	670095.00	302213.4444	0.451
Pre-ban 2 (1969-78)	670095.00	377119.7778	0.563
Pre-ban 3 (1979-87)	670095.00	333535.5000	0.498
Post-ban 1 (1988-96)	670095.00	569258.8889	0.850
Post-ban 2 (1997-2005)	670095.00	574726.8889	0.858
Post-ban 3 (2006-14)	670095.00	572973.3333	0.855

Source: KSPB, 1960-2014

The sustainability implication of the marine fishery in Kerala is evaluated by using the catch data of 10 species over a period of 1960-2014 dichotomizing this into pre-ban period and post-ban period. For each species, the historical maximum catch is worked out and subsequently compared with the average annual catch and is given in Table 2.15. It is clear that none of the species in either group evaluated shows abundance and hence exhibits patterns of heavy or moderate depletion. This shows that trawl ban has in fact generated positive impact on the sustainability as the depletion status of most of the species under evaluation have shown

comparatively better position in relation to the pre-ban phase. But the important inference obtained from this kind of analysis is the worse depletion level of the common-man‟s local species sardine to moderate level of depletion after the post-ban. Similar trend is also identifiable with respect to mackerel, which again is highly linked to the local fish economy. Another important inference to connect this is that, this moderate depletion may change to heavy depletion status which in turn will have high vulnerability to the food security of the marginalized as these species are mostly listing in the poor people‟s consumption basket. The recent price trends of these two species also validate its high price volatility owing to its supply demand shocks. This may be basically connected to climate induced factors as climate change affects mostly to the surface waters of the coastal sea which force these pelagic species to move to distant waters or else these species might behave as straddling species so as to migrate to cool water zones.

Table 2.15. Species-wise Depletion Status

	Max	Pre-ban	Post-ban	Total	Pre-ban	Post-ban	Total
Oil Sardine	250400	126533.5000	121347.6923	124036.6296	0.505	0.485	0.495
Caranx	67682	6819.6667	26736.4444	19623.3095	0.101	0.395	0.290
Mackerel	128411	23515.9643	58797.7407	40836.1091	0.183	0.458	0.318
Cephalopods	43942	3517.0833	23106.6923	16920.5000	0.080	0.526	0.385
Penaeid Prawn	78119	35851.1071	51427.4615	43350.8333	0.459	0.658	0.555
Perches	74813	11995.7143	40742.5926	30926.5854	0.160	0.545	0.413
Anchovilla	55030	17600.9286	32920.9259	27689.7073	0.320	0.598	0.503
Sciaenides	17720	7414.6250	9756.8519	8885.3256	0.418	0.551	0.501
Tunnies	32615	4999.7857	14417.2222	9622.8909	0.153	0.442	0.295
Pomfrets	4242	1374.4615	1921.4231	1647.9423	0.324	0.453	0.388

Source: KSPB, 1960-2014

Fishery development dynamics that happened in Kerala had been entirely different from other coastal states in the initial stages as Kerala fishery was stimulated with the infusion of new technology through INP. This process hence has attained the status of a globalised sector with radical transformations from the beginning of the 60s. The result of this process helped Kerala, the small coastal state of India, the leader in fishing and related activities. Like the Newtonian mechanics the action in technology-output-dynamics generated its own reaction in the basic indicator levels, as explained in section I of Chapter 2, exhibiting positive changes and thereby resulting in overcoming the abysmal poverty in the coastal belts. But still most of the basic indicators are too poor to make any comparisons with the states central tendency, which needs measures of dispersion to identify the dissimilarities. The total effect of all these developed into a

tremor in the system settling to resource depletion and hence created a scenario of widespread resistance from the fishers through collective action. Aftermath comes in the form of trawl ban with factional resistance. Then came the recuperation stage and finally settling the output closer to the maximum sustainable yield level. This has been well narrated in section II of Chapter 2 with six specific epochs, each explains a unique dynamics. Chapter 3 tries to unravel how these output and basic indicators have played in moulding the present status of the fishers" family and their socio economics based on primary inferences collected from the three major fishing locations of Kerala.

Chapter 3

Family Status and Socio economics of Fisher folks

Section 1 in Chapter 2 has indentified some shifts in the basic indicators of the fishers in the temporal levels and also in the pre and post liberalized fishing compartmentalization. In the basic indicators category, the socio-economic changes have not been in the level expected comparing the astounding changes that happened in the Kerala economy. This helped the fishers to be explained as outliers in the development process generally attaching them with the tribes of Kerala in terms of poverty and basic amenities of living. Comparing these two groups the fishers basic indicators show striking improvement during the pre and post globalised period particularly in areas of sanitation, drinking water facilities, electricity, dwelling patterns and infrastructure. Chapter 3 tries to explain the present nature of the socio economics and family status in terms of living standard and other basic aspects necessary for a quality living in the coastal areas abetting primary data collected from the three major fishery hubs of Kerala.

3.1 Religion

The sample households" information relating to religious affiliation of the fishers in the three district shows (Table 3.1) significant differences in religious affiliation based on district. The Kozhikode households explain a mix of Hindus and Muslims with Muslim fishers predomination. While in Ernakulam it is highly skewed towards Christian community with 70 percent, Hindus come to 28 percent and Muslim households just 2 percent. All the fishers surveyed in Kollam indicate only the Christians.

Table 3.1. District and Religion

District	Religion (in percent)			Total
	Hindu	Muslim	Christian	
Kozhikode	48.0	52.0	0.0	100.0
Ernakulam	70.0	2.0	28.0	100.0
Kollam	0.0	0.0	100.0	100.0
Total	39.3	18.0	42.7	100.0

Source: Survey data, 2016

3.2 Gender and Age

The gender ratio of the household members is almost identical in the three districts as given in Table 3.2.

Table 3.2. District and Gender

			Sex		Total
			Male	Female	
District	Kozhikode	Count	236	221	457
		% within District	51.6	48.4	100.0
	Ernakulam	Count	230	228	458
		% within District	50.2	49.8	100.0
	Kollam	Count	245	225	470
		% within District	52.1	47.9	100.0
Total		Count	711	674	1385
		% within District	51.3	48.7	100.0

Source: Survey data, 2016

Table 3.3 depicts the district-wise age categorisation of the household members, which shows favourable population window in the fishing community in the three major fishing hubs. Although majority of the members belongs to the age group of 15-59, a clear district-wise disparity in the age structure is observed and hence this is further analysed with the help of Chi-Square statistics, which shows significant differences (Table 3.4). Comparing the age structure in the three districts shows that dependent population based on age is comparatively higher in Kozhikode and less in Ernakulam and Kollam. The proportion of working age-group is somewhat comparable in all the three districts.

Table 3.3. District and Age

District		Age cat							Total
		5 years and below	6 to 17 years	18 to 29 years	30 to 39 years	40 to 49 years	50 to 59 years	60 years and above	
Kozhikode	Count	39	112	113	70	63	43	17	457
	% within District	8.5	24.5	24.7	15.3	13.8	9.4	3.7	100.0
Ernakulam	Count	16	85	100	72	81	56	48	458
	% within District	3.5	18.6	21.8	15.7	17.7	12.2	10.5	100.0
Kollam	Count	42	80	114	66	82	48	38	470
	% within District	8.9	17.0	24.3	14.0	17.4	10.2	8.1	100.0
Total	Count	97	277	327	208	226	147	103	1385
	% within District	7.0	20.0	23.6	15.0	16.3	10.6	7.4	100.0

Source: Survey data, 2016

Table 3.4. Chi-Square Tests: District and Age

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	39.674	12	.000
Likelihood Ratio	42.358	12	.000
Linear-by-Linear Association	8.387	1	.004

Gender inference based on age of the household members is shown in Table 3.5. Gender composition is almost similar in all the age categories except for 50-59 and above 60 age groups as males predominate with 59.9 percent and 53.4 percent, respectively.

Table 3.5. Age and Gender

			Sex		Total
			Male	Female	
Age	5 years and below	Count	50	47	97
		% within Age cat	51.5	48.5	100.0
	6 to 17 years	Count	140	137	277
		% within Age cat	50.5	49.5	100.0
	18 to 29 years	Count	164	163	327
		% within Age cat	50.2	49.8	100.0
	30 to 39 years	Count	100	108	208
		% within Age cat	48.1	51.9	100.0
	40 to 49 years	Count	114	112	226
		% within Age cat	50.4	49.6	100.0
	50 to 59 years	Count	88	59	147
		% within Age cat	59.9	40.1	100.0
	60 years and above	Count	55	48	103
		% within Age cat	53.4	46.6	100.0
Total		Count	711	674	1385
		% within Age cat	51.3	48.7	100.0

Source: Survey data, 2016

3.3 Marital Status and Relation

Table 3.6 displays marital status of the household‟s members. Majority (74.2 percent) of the household members is married and 19.6 percent are unmarried, whereas the widowed/widower are only 6.4 percent of the total sample members. Inter-district variation in marital status of the household members based on primary data shows very little variation.

Table 3.6. District and Marital Status

			Marital Status					Total
			Unmarried	Married	Widow/ Widower	Divorced	Separated	
District	Kozhikode	Count	60	229	16	0	1	306
		% within District	19.6	74.8	5.2	0.0	0.3	100.0
	Ernakulam	Count	64	263	30	0	0	357
		% within District	17.9	73.7	8.4	0.0	0.0	100.0
	Kollam	Count	69	258	19	1	1	348
		% within District	19.8	74.1	5.5	0.3	0.3	100.0
Total		Count	193	750	65	1	2	1011
		% within District	19.1	74.2	6.4	0.1	0.2	100.0

Source: Survey data, 2016

Table 3.7 illustrates the relationship of the members with the household heads. The spread based on its percentage is, unmarried children (28.6), spouse (18.3), grand-children (11.8), married-children (10.0) and son-in-laws and daughter-in- laws of the household head.

Table 3.7. Relationship with the Household Head

	Frequency	Percent
Head of the HH	300	21.7
Father/ Mother	11	0.8
Husband/Wife	253	18.3
Unmarried children	396	28.6
Married children	138	10.0
Son in law/Daughter in law	114	8.2
Grandchild	164	11.8
Father in law/Mother in law	1	0.1
Brother/sister	8	0.6
Total	1385	100.0

Source: Survey data, 2016

Family status based on gender and relationship with the head of the household indicate that 87.3 percent are male headed of which 84.3 percent are living with their spouse (Table 3.8).

Table 3.8. Gender of the household head

			Sex		Total
			Male	Female	
Relation	Head of the HH	Count	262	38	300
		% within Relation	87.3	12.7	100.0
	Father/ Mother	Count	2	9	11
		% within Relation	18.2	81.8	100.0
	Husband/Wife	Count	1	252	253
		% within Relation	0.4	99.6	100.0
	Unmarried children	Count	228	168	396
		% within Relation	57.6	42.4	100.0
	Married children	Count	110	28	138
		% within Relation	79.7	20.3	100.0
	Son in law/Daughter in law	Count	7	107	114
		% within Relation	6.1	93.9	100.0
	Grandchild	Count	97	67	164
		% within Relation	59.1	40.9	100.0
	Father in law/Mother in law	Count	0	1	1
		% within Relation	0.0	100.0	100.0
	Brother/sister	Count	4	4	8
		% within Relation	50.0	50.0	100.0
Total		Count	711	674	1385
		% within Relation	51.3	48.7	100.0

Source: Survey data, 2016

3.4   Educational Qualification

Family status of the fishing community is generally considered low because of the perennial low nature of education of the fishing community. This in a way retards their social and economic development. Lack of educational attainment also prevents them from the vertical

mobility from the income-poverty traps and hence ends in low material attainment. Compared to the educational attainment data (secondary) in an inter-temporal dimension, the current status (primary) shows good improvement but the situation is still very dismal in terms of state averages. But it demonstrates significant inter-district variation in the educational attainment of the household members as illustrated in Table 3.9. The spatial comparison shows that more than 75 percent from Ernakulam and around 80 percent for Kollam and Kozhikode have education qualification SSLC and below. The higher education status is still very poor as graduates and above and those with professional qualifications are considerably less. However, based on numbers, the higher education holders are more in Ernakulam. This is mainly due to the better access to the educational institutions.

Table 3.9. District and Education

			Education											Total
			Illiterate	Literate without formal schooling	Primary	Upper Primary	Up to SSLC	SSLC pass	Pre-degree/Plus II	Diploma/Certificate course	Graduation	Post-graduation	Professional Course	
District	Kozhikode	Count	12	3	110	104	79	50	36	4	19	1	0	418
		% within District	2.9	0.7	26.3	24.9	18.9	12.0	8.6	1.0	4.5	0.2	0.0	100.0
	Ernakulam	Count	13	6	90	90	67	64	49	8	43	3	9	442
		% within District	2.9	1.4	20.4	20.4	15.2	14.5	11.1	1.8	9.7	0.7	2.0	100.0
	Kollam	Count	23	3	134	78	61	43	47	18	16	2	3	428
		% within District	5.4	0.7	31.3	18.2	14.3	10.0	11.0	4.2	3.7	0.5	0.7	100.0
Total		Count	48	12	334	272	207	157	132	30	78	6	12	1288
		% within District	3.7	0.9	25.9	21.1	16.1	12.2	10.2	2.3	6.1	0.5	0.9	100.0

Source: Survey data, 2016

3.5 Activity

The major determinant of family status is connected with the activity matrix of the households; this is given in Table 3.10 and Figure 3.1. The activity status in the six fold division explains that „employed category" forms the major share group of the total household members.

However, district-wise comparison of the activity status shows differences in the pattern as the employed members are higher in Ernakulam and Kollam districts (40.8 percent and 36.6 percent) respectively with the Kozhikode fishers with 30 percent. Kozhikode also has the highest percentage of dependent population, prominent among them being students (30.6 percent) and dependent spouses" mother or other female relatives of the household head (28.4 percent). This is primarily connected to the joint-family system among the households of Kozhikode compared to the nuclear family setup in the other two districts. Unlike the women fishers of southern or middle Kerala, the women in the northern region households are confined to household activities.

Table 3.10. District-wise Activity Status

			Activity						Total
			Employed	Unemployed	Student	Doing household chores	Unable to work	Others	
District	Kozhikode	Count	137	6	140	130	16	28	457
		% within District	30.0	1.3	30.6	28.4	3.5	6.1	100.0
	Ernakulam	Count	187	20	118	90	31	12	458
		% within District	40.8	4.4	25.8	19.7	6.8	2.6	100.0
	Kollam	Count	172	22	104	115	20	37	470
		% within District	36.6	4.7	22.1	24.5	4.3	7.9	100.0
Total		Count	496	48	362	335	67	77	1385
		% within District	35.8	3.5	26.1	24.2	4.8	5.6	100.0

Source: Survey data, 2016

Figure 3.1. District-wise Activity Status
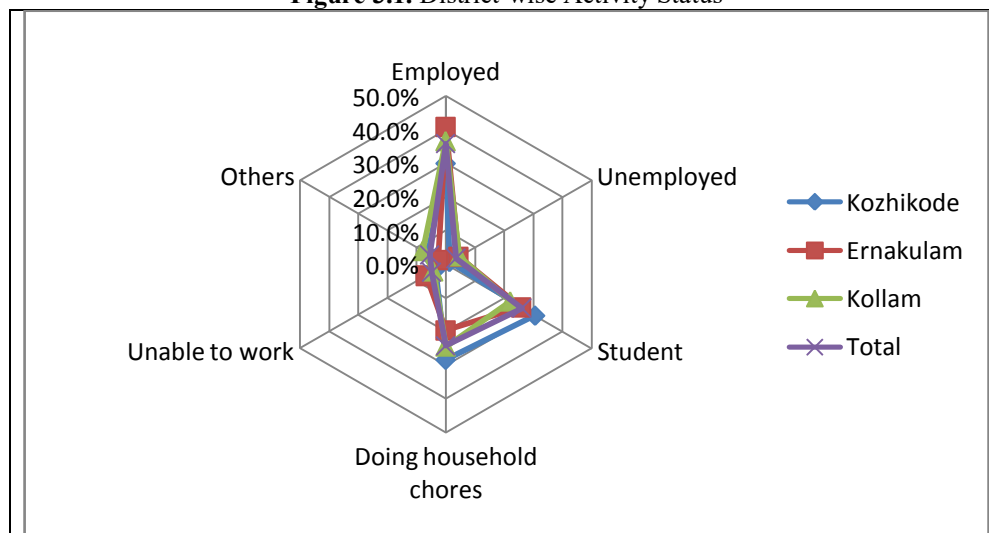
Source: Worked out from Table 3.10

52

The activity status differs largely based on gender of the household members. The activity status of members above 5 years is shown in Table 3.11. In this category male members employed constitute 63.8 percent compared to 11.8 percent of females.

Table 3.11. Gender and Activity

			Activity					Total
			Employed	Unemployed	Student	Doing household chores	Unable to work	
Sex	Male	Count	422	32	176	0	31	661
		% within Sex	63.8	4.8	26.6	0.0	4.7	100.0
	Female	Count	74	16	166	335	36	627
		% within Sex	11.8	2.6	26.5	53.4	5.7	100.0
Total		Count	496	48	342	335	67	1288
		% within Sex	38.5	3.7	26.6	26.0	5.2	100.0

Source: Survey data, 2016

Table 3.12 gives the details of the type of activity done by the employed household members. Most of the fishers engage in fishing and related activities and those in the non-fishing activities on a full-time basis are considerably less. The dependency of the household members in fishing activities is higher in Kozhikode (89.1 percent) and less in Ernakulam district (70.6 percent).

Table 3.12. District and Activity Type

			Type of Employment		Total
			Fishing	Non-fishing	
District	Kozhikode	Count	122	15	137
		% within District	89.1	10.9	100.0
	Ernakulam	Count	132	55	187
		% within District	70.6	29.4	100.0
	Kollam	Count	130	42	172
		% within District	75.6	24.4	100.0
Total		Count	384	112	496
		% within District	77.4	22.6	100.0

Source: Survey data, 2016

Gender-wise (Table 3.13), the males are engaged mostly in fishing and allied activities (81.8 percent), compared to 52.7 percent females.

Table 3.13. Gender and Activity Type

			Type of Employment		Total
			Fishing	Non-fishing	
Sex	Male	Count	345	77	422
		% within Sex	81.8	18.2	100.0
	Female	Count	39	35	74
		% within Sex	52.7	47.3	100.0
Total		Count	384	112	496
		% within Sex	77.4	22.6	100.0

Source: Survey data, 2016

Further analysis based on sub-sectoral fishing and others of the employed household members gives interesting inference (Table 3.14 and Figure 3.2). Those employed in the non-motorised

sector comes only 11.7 percent of the total members engaged in fishing. Majority is engaged in motorised sector with 45.3 percent, whereas 22.4 percent in allied activities and 20.6 percent in mechanised sector in the category of fishery employment. Those who work in the non-fishing sector are mostly wage earners and the self-employed are very less.

Table 3.14. Activity type and Employment details

			Employment								Total
			Non-motorised	Motorised	Mechanised	Other allied	Non-fishing self employed	Non-fishing wage employed	Pvt/Public office jobs	Non-fishing others	
Type of Employment	Fishing	Count	45	174	79	86	0	0	0	0	384
		% within Type of Employment	11.7	45.3	20.6	22.4	0.0	0.0	0.0	0.0	100.0
	Non-fishing	Count	0	0	0	0	22	69	19	2	112
		% within Type of Employment	0.0	0.0	0.0	0.0	19.6	61.6	17.0	1.8	100.0
Total		Count	45	174	79	86	22	69	19	2	496
		% within Type of Employment	9.1	35.1	15.9	17.3	4.4	13.9	3.8	0.4	100.0

Source: Survey data, 2016

Figure 3.2. Activity type and Employment details
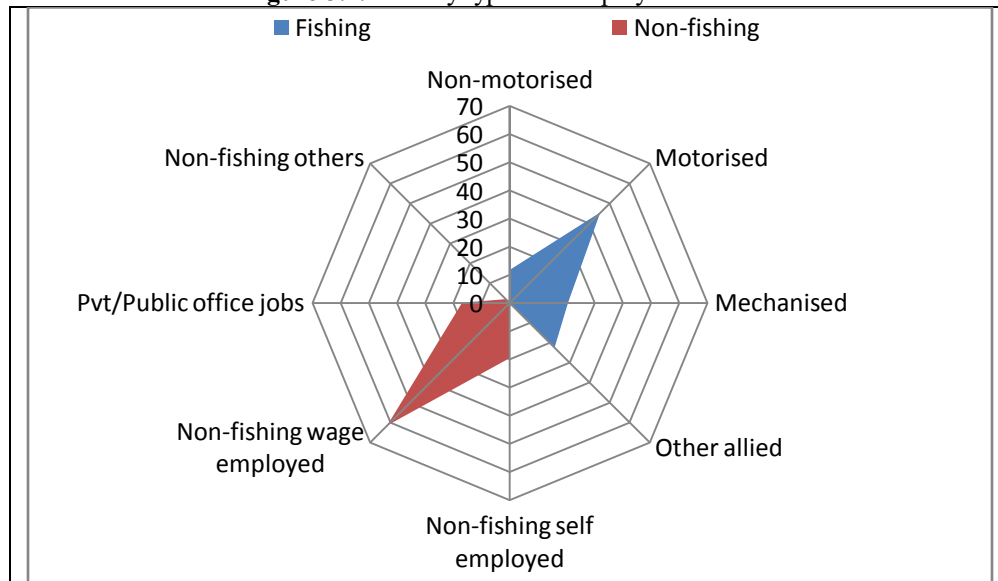
Source: Worked out from Table 3.14

The analysis based on sub-sector employment of the 384 members engaged in the fishing and allied activities are evaluated in district-wise framework (Table 3.15), shows that the traditional or non-motorised fishers are higher in Kozhikode (15.6 percent). In this categorisation 33.3 percent of the fishers in the Ernakulam district work in allied activities.

Table 3.15. District and Type of Fishing Employment

			Fishing Employment				Total
			Non-motorised	Motorised	Mechanised	Other allied	
District	Kozhikode	Count	19	49	26	28	122
		% within District	15.6	40.2	21.3	23.0	100.0
	Ernakulam	Count	14	43	31	44	132
		% within District	10.6	32.6	23.5	33.3	100.0
	Kollam	Count	12	82	22	14	130
		% within District	9.2	63.1	16.9	10.8	100.0
Total		Count	45	174	79	86	384
		% within District	11.7	45.3	20.6	22.4	100.0

Source: Survey data, 2016

Livelihood status in fact is determined by the number of days the fishers work in a month and this in most of the situation is illustrated with average days of work. Table 3.15 describes the results of average work days based on district and it comes to 19.60 days per month. District-wise the average work days per month are more in Kozhikode and less in Kollam.

Table 3.16. Average Work days

District	Days worked
Kozhikode	20.5109
Ernakulam	19.6471
Kollam	18.8023
Total	19.5927

The activity status of the fishers change noticeably during the trawl ban period and in fact the fishers started agitating against the trawl ban in terms of loss of employment (main factor) worked in the fishing sector. This is because trawling mostly affects the mechanised sector and also most of the motorised workers. Considering the fact that most of the workers (more than 90 percent) have been affected by the recent trawl bans as it seemed to be almost total in Kerala. Traditional sector fishers are engaged in the same sub-sector even during the trawl ban period, their earnings and catch structure are less as they do not resort to fishing considering the adverse weather conditions. This situation also makes it very difficult for the traditional crafts to venture for fishing during the ban period. As per Table 3.17 most of the fishers stick on to their own sub-sector for livelihood, as 75.3 percent in the motorised and 82.6 percent in the allied sector fishers are worked in the same sector during the trawl ban. The mechanised fishers are the most hit group as 64.6 percent do not have any other means of employment during the period. Evaluating the total livelihood impact of the workers during trawl ban, 25.8 percent of the fishers find no alternate means of employment during the ban period. The results indicate that the fishers,

especially those in the mechanised boats do not have access to any other means of activities both in the fishing or non-fishing sector. The fishers are generally left with Hobson's choice owing to lack of education and requisite skill for an alternative avocation during the ban period.

Table 3.17. Trawl Ban Employment for the Fisher folks

			Employment during trawl ban				Total
			Old and the same	Other means of Fishing	No other means of Employment	Others allied works	
Employment	Non-motorised	Count	45	0	0	0	45
		% within Employment	100.0	0.0	0.0	0.0	100.0
	Motorised	Count	131	6	34	3	174
		% within Employment	75.3	3.4	19.5	1.7	100.0
	Mechanised	Count	0	21	51	7	79
		% within Employment	0.0	26.6	64.6	8.9	100.0
	Other allied	Count	71	0	14	1	86
		% within Employment	82.6	0.0	16.3	1.2	100.0
Total		Count	247	27	99	11	384
		% within Employment	64.3	7.0	25.8	2.9	100.0

Source: Survey data, 2016

3.6   Living Conditions

The living conditions of the fishers based on house they live is evaluated with respect to ownership, condition, area, latrine, drinking water facilities and electrification, etc. This is considered as the first step towards working out their standard of the living.

3.6.1   House Conditions

Primary data show that 73.3 percent of the respondents live in own or house owned by spouse and 18 percent stay in their parent's house. Region-wise, there are some differences in the house ownership pattern (Table 3.18 and Figure 3.3) with only 56 percent of the respondents in Kozhikode are staying in own house compared to 87 percent in Ernakulam and 77 percent in Kollam. Those staying with their parents are higher in Kozhikode with 28 percent.

Table 3.18. House Ownership

			House ownership					Total
			Own	Parents	Relatives	Rented	Others	
District	Kozhikode	Count	56	28	8	1	7	100
		% within District	56.0	28.0	8.0	1.0	7.0	100.0
	Ernakulam	Count	87	11	1	1	0	100
		% within District	87.0	11.0	1.0	1.0	0.0	100.0
	Kollam	Count	77	15	1	7	0	100
		% within District	77.0	15.0	1.0	7.0	0.0	100.0
Total		Count	220	54	10	9	7	300
		% within District	73.3	18.0	3.3	3.0	2.3	100.0

Source: Survey data, 2016

Figure 3.3. House Ownership
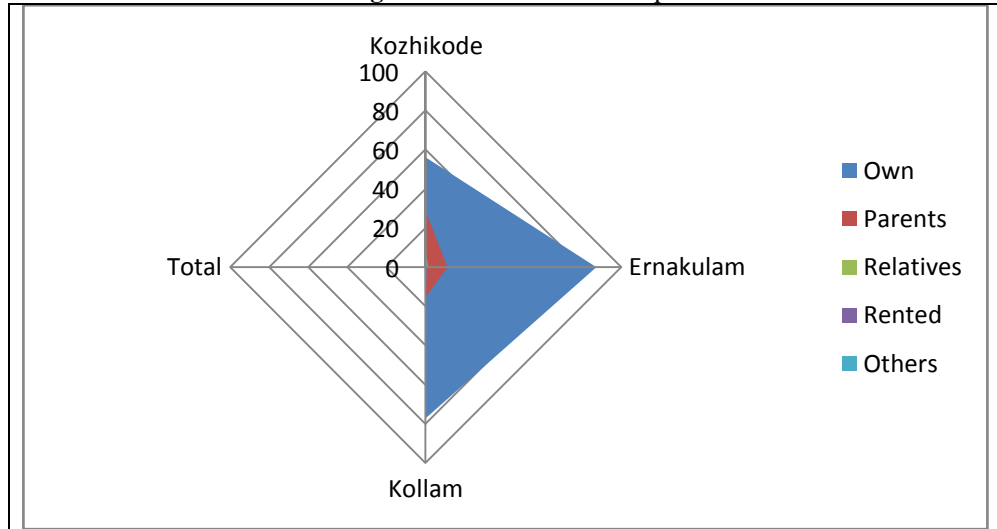
Main source of funds for house construction in majority of cases is own sources (48.7 percent) and 44.3 percent have constructed their houses with government assistance (Table 3.19). However, the percentage of houses built with government assistance is comparatively less in Kozhikode with 39 percent. Ernakulam has almost equal percentage of houses built with government support and with own funds (48 percent each). Other funding sources form a small portion. This shows that fishers have received institutional, NGO and other organisations support connected with the fishing sector. Assistance-wise Kozhikode fishers have obtained less assistance for house construction.

Table 3.19. Fund for House Construction

			Fund for construction of house			Total
			Self	Govt. Support	Others	
District	Kozhikode	Count	56	39	5	100
		% within District	56.0	39.0	5.0	100.0
	Ernakulam	Count	48	48	4	100
		% within District	48.0	48.0	4.0	100.0
	Kollam	Count	42	46	12	100
		% within District	42.0	46.0	12.0	100.0
Total		Count	146	133	21	300
		% within District	48.7	44.3	7.0	100.0

Regional difference in the condition of the houses is visible in Table 3.20. It shows that 62.3 percent of the fisher folk households are semi-pucca irrespective of regions and Kutcha houses are only 7 percent. Hence it is clear that 30.7 percent of the houses are pucca type. District-wise classification brings out the fact that Kutcha houses predominate in Kozhikode. Also, due to

increased government assistance in Ernakulam, the percentage of pucca houses is higher (42 percent). Even though government assistance in house construction for the fishers in Kollam is at par with the Ernakulam the percentage of pucca houses are only 26 percent. Field inference shows that the government assistance for constructing a house is inadequate in most of the cases. While the fishers in Ernakulam mostly arranged this amount through loans from cooperative banks or other borrowings, the houses in Kollam remain incomplete as the financial sources are limited in comparison to Ernakulam. Table 3.20 and Figure 3.4 depict the house type of the respondents in the three sample districts.

Table 3.20. Type of House

| | | | Type of house | | | Total |
			Pucca	Semi Pucca	Kutcha	
District	Kozhikode	Count	24	65	11	100
		% within District	24.0	65.0	11.0	100.0
	Ernakulam	Count	42	54	4	100
		% within District	42.0	54.0	4.0	100.0
	Kollam	Count	26	68	6	100
		% within District	26.0	68.0	6.0	100.0
Total		Count	92	187	21	300
		% within District	30.7	62.3	7.0	100.0

Source: Survey data, 2016

Figure 3.4. Type of House
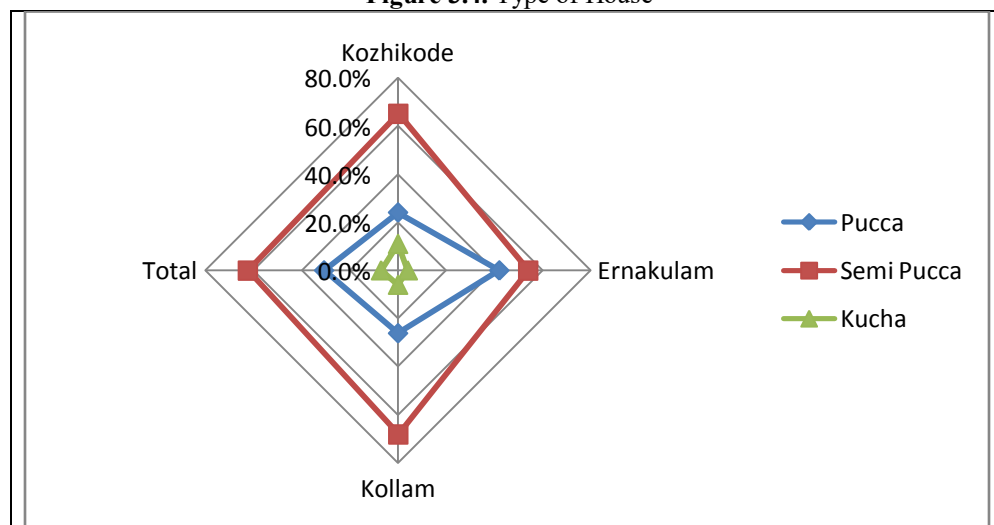
Source: Worked out from Table 3.20

Most of the fishers" houses have proper flooring and are floored mostly with tiles (Table 3.21) and only very less number of houses have floor with mud or do not have any proper flooring. However in Kozhikode the major flooring used is cement/red-oxide. Cement floored houses are lesser in Ernakulam as most (62 percent) of the houses in the district have tile flooring.

Table 3.21. Floor Material

			Floor material			Total
			Cement	Tiles	Others	
District	Kozhikode	Count	58	39	3	100
		% within District	58.0	39.0	3.0	100.0
	Ernakulam	Count	34	62	4	100
		% within District	34.0	62.0	4.0	100.0
	Kollam	Count	43	51	6	100
		% within District	43.0	51.0	6.0	100.0
Total		Count	135	152	13	300
		% within District	45.0	50.7	4.3	100.0

Source: Survey data, 2016

Tables 3.22 and 3.23 show the type of wall and roofing material used for the houses. Majority of houses have proper wall (brick) and roofing (either tile or concrete). Overall 93 percent of the houses have proper walls. District-wise, except for Kozhikode (89 percent), 93 and 97 percent of houses in Kollam and Ernakulam have proper walls. 63.7 percent of the houses have concrete roofing. Concrete houses are more in Ernakulam at 73 percent than in Kozhikode district at 56 percent. Similarly, houses with tiled roofing are more in Kozhikode and less in Ernakulam.

Table 3.22. Wall Material

			Wall Material		Total
			Cement/bricks	Others	
District	Kozhikode	Count	89	11	100
		% within District	89.0	11.0	100.0
	Ernakulam	Count	97	3	100
		% within District	97.0	3.0	100.0
	Kollam	Count	93	7	100
		% within District	93.0	7.0	100.0
Total		Count	279	21	300
		% within District	93.0	7.0	100.0

Source: Survey data, 2016

Table 3.23. Roof Material

			Roofing material				Total
			Iron/tin sheet/asbestos	Tiles	Concrete	Others	
District	Kozhikode	Count	6	38	56	0	100
		% within District	6.0	38.0	56.0	0.0	100.0
	Ernakulam	Count	4	23	73	0	100
		% within District	4.0	23.0	73.0	0.0	100.0
	Kollam	Count	4	32	62	2	100
		% within District	4.0	32.0	62.0	2.0	100.0
Total		Count	14	93	191	2	300
		% within District	4.7	31.0	63.7	0.7	100.0

Source: Survey data, 2016

3.6.2   Other Household Amenities

3.6.2.1 Source of Water

The fishers generally have pipe connection or own well for drinking water (Tables 3.24 and 3.25). District-wise difference is seen in the drinking water sources of the fishers. Main source of drinking water in the Ernakulam district is pipe connection available within the house (46 percent); about 45 percent also depend on public sources like public taps. But some of the fisher"s hubs in Ernakulam have perennial water problems and this is mostly affected by the households depending on public tap for drinking water. However the well-connected own pipe connections also have problems of drinking water during summer seasons and also contamination in the drinking water in monsoon seasons. Drinking water in Kozhikode district is mostly from common tap or well for 43 percent of the households. But 33 percent depend on own well and only 3 percent have pipe connection in their houses. This shows that 21 percent in Kozhikode district mostly depend on other sources. These are mostly households from the Chaliyam-Beypore fishing villages in Kozhikode district. During the field survey they had expressed their concerns with regard to the non-availability of safe drinking water throughout the year. In Kollam, own well is the major source of drinking water (38 percent) followed by pipe connection (34 percent). 23 percent of the fishers" houses in Kollam use water collected from public wells/taps for drinking purposes.

Table 3.24. Source of Drinking Water

			Drinking Water Source				Total
			House/Piped connection	Own well	Public well/Tap	Others	
District	Kozhikode	Count	3	33	43	21	100
		% within District	3.0	33.0	43.0	21.0	100.0
	Ernakulam	Count	46	8	45	1	100
		% within District	46.0	8.0	45.0	1.0	100.0
	Kollam	Count	34	38	23	5	100
		% within District	34.0	38.0	23.0	5.0	100.0
Total		Count	83	79	111	27	300
		% within District	27.7	26.3	37.0	9.0	100.0

Source: Survey data, 2016

Even though the primary data relating to source of drinking water is promising with own sources (54.4 percent), drinking water shortage has always been termed as a lifelong curse for the inhabitants in the coastal belts of Kerala, especially the fishers. The fishing villages even in the urbanized region have been termed as classic examples for this pathetic condition. While during the summer, there will be acute shortage of water; during monsoon the coastal villages

will be flooded. The piped water they get is often impure and saline and the supply is also erratic in nature. This situation also generates several health ailments among the fishers especially during the rainy seasons. Hence this is still an unsolved problem in the coastal belts as they cannot depend on well water for drinking because of high salinity condition.

Table 3.25. Source of Water for House use

			Source of water for house use				Total
			House/Piped connection	Own well	Public well/Tap	Others	
District	Kozhikode	Count	4	80	6	10	100
		% within District	4.0	80.0	6.0	10.0	100.0
	Ernakulam	Count	38	33	27	2	100
		% within District	38.0	33.0	27.0	2.0	100.0
	Kollam	Count	28	45	23	4	100
		% within District	28.0	45.0	23.0	4.0	100.0
Total		Count	70	158	56	16	300
		% within District	23.3	52.7	18.7	5.3	100.0

Source: Survey data, 2016

For other household uses, the fishers depend on own well. However, a regional disparity in the source of water used for other uses is seen with only 4 percent of houses in Kozhikode using water from house piped connection compared to 38 percent in Ernakulam and 28 percent in Kollam. Majority (80 percent) in Kozhikode uses water from own well for household purposes. Figure 3.5 shows the detailed district-wise use and source of drinking water.

Figure 3.5. Source of Water
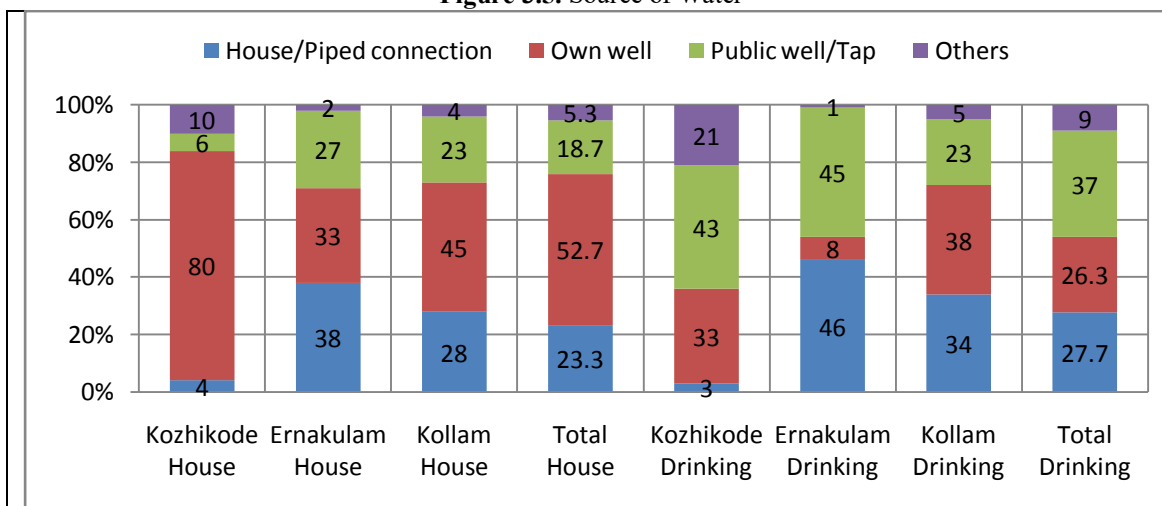
Source: Worked out from Table 3.24 and 3.25

3.6.2.2 Latrine Facility

Latrine facility, though unavailable to a community in the early stages of fisheries development have almost reached a situation of 100 percent level based on the primary survey

data. But the latest pucca latrine with septic tank facility is available only for less than 50 percent of the fishers" households, in Ernakulam the facility is available to 41 percent compared to 22 percent for Kozhikode and 32 percent for Kollam (Table 3.26). A major problem connected with the usability of latrine facilities available in the marine fishery households during monsoon seasons because of water logging and this causes several communicable diseases in the fisher"s households.

Table 3.26. Latrine Facility

			Latrines		Total
			Serviceable latrines	Pucca latrines with water supply	
District	Kozhikode	Count	78	22	100
		% within District	78.0	22.0	100.0
	Ernakulam	Count	59	41	100
		% within District	59.0	41.0	100.0
	Kollam	Count	68	32	100
		% within District	68.0	32.0	100.0
Total		Count	205	95	300
		% within District	68.3	31.7	100.0

Source: Survey data, 2016

3.6.2.3 Electrification

Another area which is to be worth mentioned is electrification of the coastal villages. Compared to the 70s and 80s the change is phenomenal as per the current surveyed data. More than 95 percent of the households are electrified and electrification rate in Ernakulam is 100 percent with meager variation among the three districts as given in Table 3.27.

Table 3.27. Source of Light

			Source of Light		Total
			Electrified	Others	
District	Kozhikode	Count	98	2	100
		% within District	98.0	2.0	100.0
	Ernakulam	Count	100	0	100
		% within District	100.0	0.0	100.0
	Kollam	Count	99	1	100
		% within District	99.0	1.0	100.0
Total		Count	297	3	300
		% within District	99.0	1.0	100.0

Source: Survey data, 2016

3.6.2.4 Main Fuel used for Cooking

LPG is the main fuel used for cooking in 74.3 percent of the households. District-wise, there is slight variation as more than 80 percent of the fishers" households in Ernakulam and Kollam use LPG for cooking, whereas the percentage of houses using LPG are only 55 percent

in Kozhikode for cooking purposes. The district-wise cross tabulation results are shown in Table 3.28.

Table 3.28. Main Fuel used for Cooking

			Fuel		Total
			Wood	Gas	
District	Kozhikode	Count	45	55	100
		% within District	45.0	55.0	100.0
	Ernakulam	Count	13	87	100
		% within District	13.0	87.0	100.0
	Kollam	Count	19	81	100
		% within District	19.0	81.0	100.0
Total		Count	77	223	300
		% within District	25.7	74.3	100.0

Source: Survey data, 2016

3.6.2.5 Other Household Characteristics

The district-wise average area of house, number of rooms and land area is shown in Table 3.30. Average number of rooms per-household is less than 2.5 for three districts. Land possession (average) shows that it is 5.63 cents per-household and area of house comes to 530 sq. ft. District-wise average land ownership pattern shows that Kozhikode has 6.81 cents and 4.65 cents for Kollam. In terms of area of houses, Ernakulam has the highest average value and Kozhikode has the lowest value (3.29).

Table 3.29. Household Attributes

District	No of Rooms	Area of House (Sq.ft)	Area of land
Kozhikode	2.4500	513.0000	6.8150
Ernakulam	2.3200	540.5700	5.4250
Kollam	2.2000	536.9200	4.6510
Total	2.3233	530.1633	5.6303

3.7   Standard of Living Index (SLI)

Primary data and field inferences show considerable differences in the living standards of fishers spatially. Standard of Living Index (SLI) of the community normally explains the well being of the people either collectively or across groups based on the perception of the people *inter alia* their basic household living conditions. This is constructed by considering several basic indicators like ownership of house, type of house, drinking water, energy used for lighting, fuel used for cooking, type of latrine, etc. by valuing it individually. The variables are then inspecting on a three point scale as per their combined score. Overall, majority of fisher households exhibits medium to low level of standard of living (Table 3.30). District-wise

evaluation confirms a clear variation in the SLI. The Ernakulam district as usual outperforms other districts in terms of the SLI indicators with more households in the high SLI group and also less number of households in the low SLI. Most of the households in Kozhikode are in the low SLI category and only 4 households in the district are in high SLI. Households" category according to medium SLI is from the Kollam fishing villages.

Table 3.30. District and SLI

District	SLI			
	Low	Medium	High	Total
Kozhikode	60	36	4	100
Ernakulam	16	64	20	100
Kollam	34	51	15	100
Total	110	151	39	300

Source: Survey data, 2016

To highlight the spatial variation based on districts with respect to SLI the Correspondence Chart is seemed to be inferential (Figure 3.6). Kozhikode is closer to the low SLI, whereas Kollam and Ernakulam exhibit nearer to the medium SLI pattern. SLI evaluation of the household characteristics explains that the fishers cannot be compared with the mainstream population of others living in these urban centers, but the household's living standards of the fishers have showed considerable improvement. It is vital that the earnings of the fishers are partly responsible but role of government departments like the Department of Fisheries, Matsyafed, etc. have played pivotal roles in this impetus. Also, the government assistance given for construction/renovation of houses and initiatives for the electrification of fishing villages, etc. have contributed much to the coastal fishers households in the sample villages.

Figure 3.6. Correspondence Chart: District and SLI
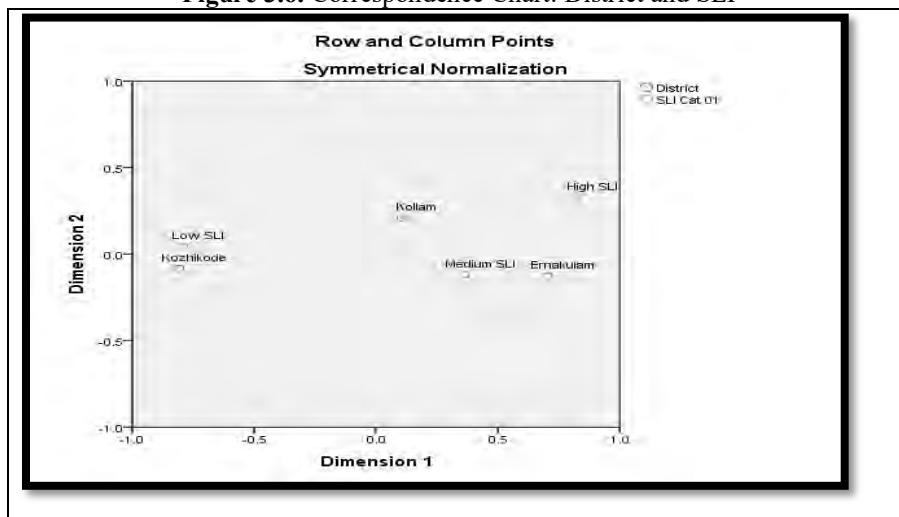
Source: Worked out from Survey data, 2016

3.8   Assets and Membership Benefits

Assets of the fishers are considerably poor in the sample households.

Figure 3.7. Household Assets

Figure 3.8. Transportation

Figure 3.9. Fishing Assets
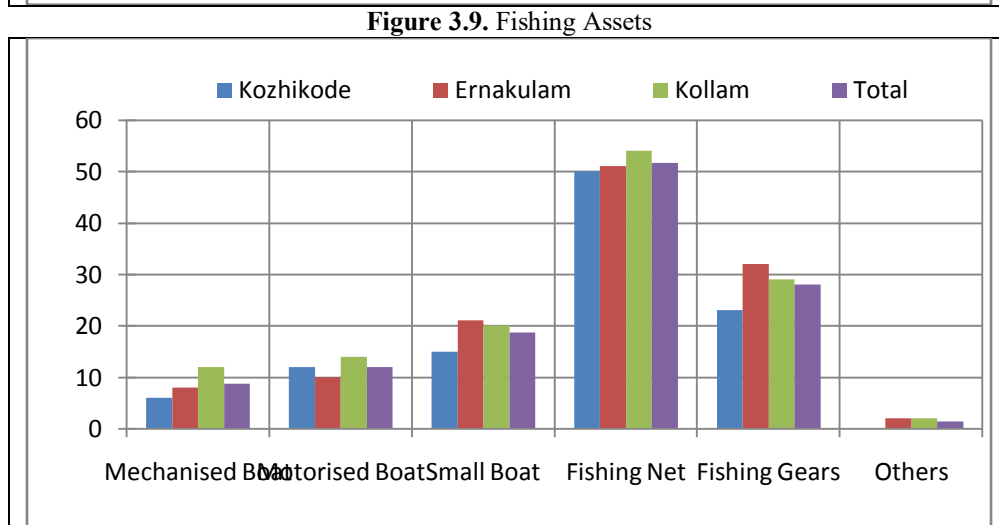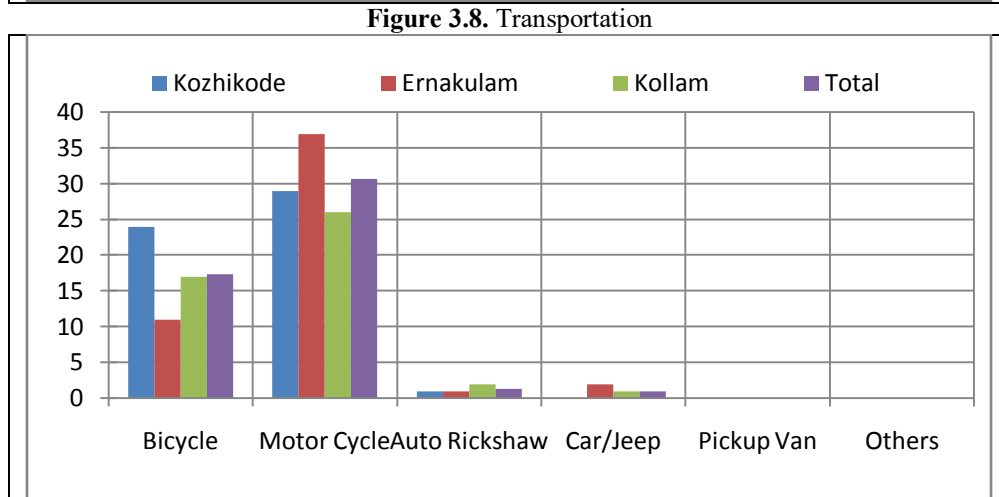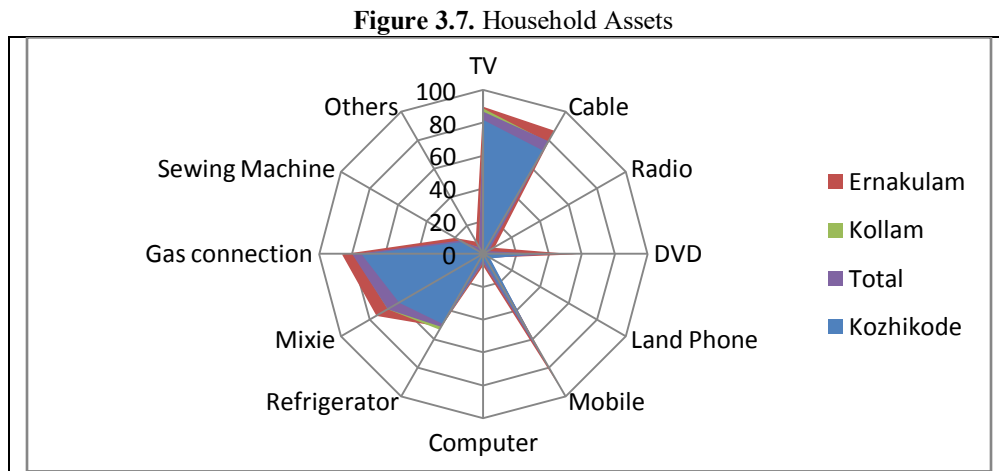
Source: Worked out from Appendix 3.1, 3.2 and 3.3

General household assets, luxury items, transportation and fishing assets are collected for this purpose. Spatial evaluation in this direction again shows better performance in the sample fishing villages from the Ernakulam district. The evaluation shows that household assets mostly consists of general household assets like TV, cable connection, mobile phone, cooking gas, etc. and these are owned by more than 75 percent of the households (Figure 3.7). Others assets like the refrigerator and mixer are possessed by 51 percent and 67 percent of the households respectively. Irrespective of the districts, the vehicles are owned only by a select few of the households and are mostly limited to bicycles and motor cycles. Auto-rickshaw or car is possessed by one percent of the total households (Figure 3.8). Ownership of fishing assets like the mechanised and large motorised boats is also very less (Figure 3.9). Though some of the fishers own these, it is mostly in the form of collective ownership. Fishing net is owned by 52 percent of the households and 29 percent own other fishing gears. One important inference with regard to the households and transportation assets is that households that have sewing machine (self-employment source among women) and auto-rickshaw (a form of non-fishing self-employment among men), are only 17 percent and 1 percent in the total sample. This implies the paucity of non-fishing activity to earn something during the trawl ban period. It is interesting to note that all the households have ration cards (Figure 3.10). The Ernakulam has the highest number of households with insurance, APL Ration Card and health card and less number of households with a BPL Ration Card. The Kozhikode fishers have more BPL card. In terms of the access to health insurance Ernakulam fishers are in better off position than the others. One pertinent fact is that even though the household poverty in terms of per-capita earnings and spending is low, more than 50 percent of the fishers have BPL ration card.

Figure 3.10. Membership Benefits
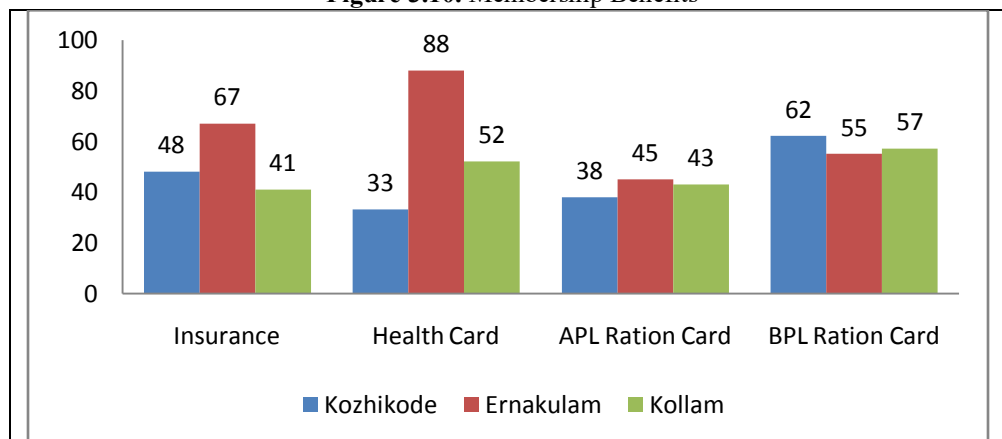
Source: Worked out from Appendix 3.4, 3.5 and 3.6

66

3.9   Livelihood and Income

Apart from the occupational concern and lack of skill set and finance, low income is yet another matter among the fishers. Their earnings are highly erratic owing to the seasonal nature of employment inbuilt with the seasonal amplitudes of fisheries and hence difficult to analyze their nature of expenditure. Hence it is meaningful to situate how individual income determines household income and household expenditure.

3.9.1   Individual Income

The average income for the three districts is shown in Table 3.31.

Table 3.31. Average Individual Income

District	Employment	Income
Kozhikode	Non-motorised	4181.5789
	Motorised	6010.2041
	Mechanised	9019.2308
	Other allied	5107.1429
	Non-fishing self employed	4750.0000
	Non-fishing wage employed	8312.5000
	Pvt/Publc office jobs	8700.0000
	Total	6357.2993
Ernakulam	Non-motorised	4800.0000
	Motorised	8313.9535
	Mechanised	9387.0968
	Other allied	4272.7273
	Non-fishing self employed	6714.2857
	Non-fishing wage employed	7257.8947
	Pvt/Publc office jobs	9625.0000
	Non-fishing others	2000.0000
	Total	6991.9786
Kollam	Non-motorised	4308.3333
	Motorised	6567.0732
	Mechanised	7806.8182
	Other allied	3857.1429
	Non-fishing self employed	7923.0769
	Non-fishing wage employed	6456.5217
	Pvt/Publc office jobs	8666.6667
	Total	6508.4302
Total	Non-motorised	4407.7778
	Motorised	6841.9540
	Mechanised	8825.9494
	Other allied	4476.7442
	Non-fishing self employed	7250.0000
	Non-fishing wage employed	7113.0435
	Pvt/Publc office jobs	9078.9474
	Non-fishing others	2000.0000
	Total	6648.9919

Source: Worked out from the Survey data, 2016

Ernakulam fishers have the highest average income (Rs. 6991.98), followed by Kollam (Rs. 6508.43) and Kozhikode (Rs. 6357.30). Figure 3.16 shows the mean value of individual income (for all activities) based on district and gender. Irrespective of districts, the male income is higher than the female income, which is clear from the gender-wise error bars for the three districts. Among the districts, Ernakulam has the highest income (Rs. 7863.31) followed by Kollam (Rs. 6837.42) and Kozhikode (Rs. 6465.53). Average female income also shows a similar district-wise variation (Figure 3.11).

Figure 3.11. District and Individual Income
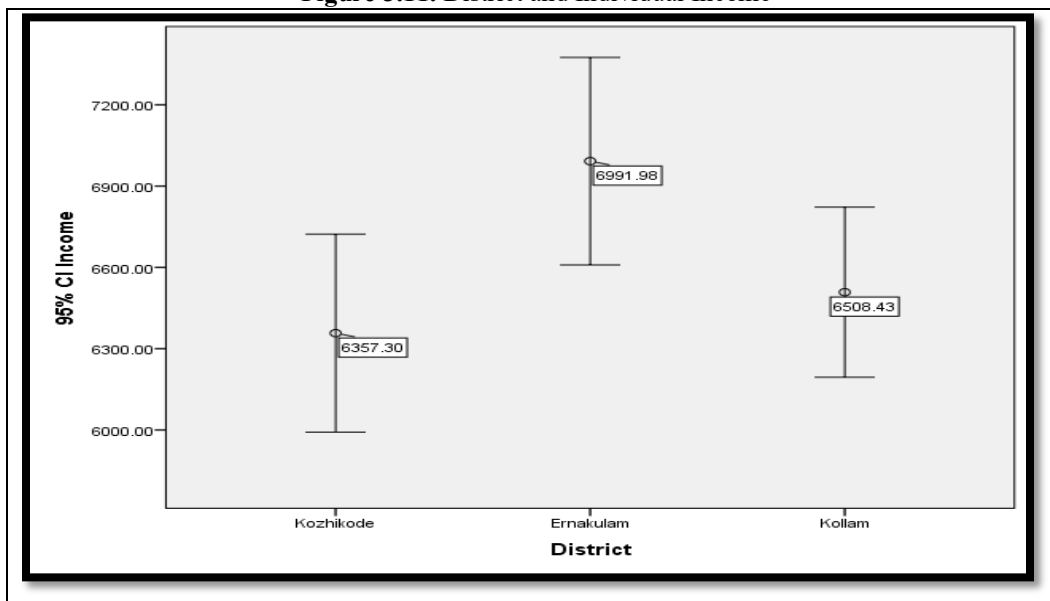
The average individual income varies highly based on activity (Figure 3.12). The earnings from the fishing activities are lower than the non-fishing activities. District-wise, the income from the fishing activities is higher in Ernakulam, followed by Kollam and Kozhikode. For the non-fishing activities, Kozhikode has the highest mean income, followed by Ernakulam and Kollam. Overall, the average earning from the non-fishing activities are higher than the fishing activities. This is due to the fact that the non-fishing work is mainly related to wage labour in non-farm sector, private/public jobs, self-employment, etc. which are highly non-seasonal compared to fishing (Figure 3.13). The earnings of the non-fishing activities are depending on the number of days worked, whereas the days of employment do not determine the earnings of fishing and allied activities.

Figure 3.12. District and Individual Income based on Gender
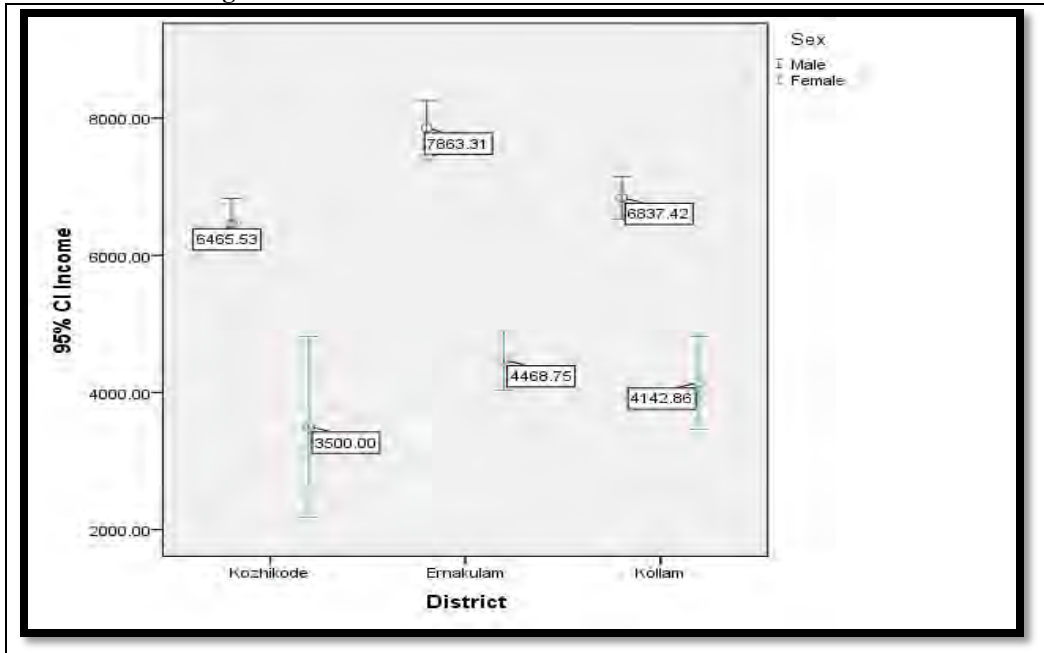
Source: Worked out from Survey data, 2016

Figure 3.13. District and Individual Income based on Activity type
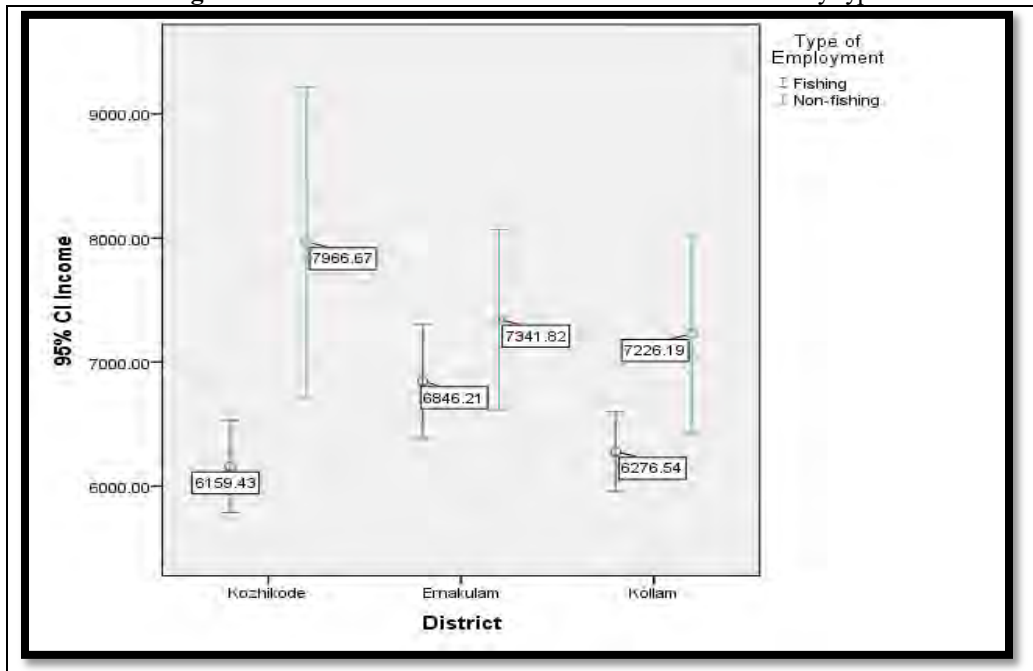
Source: Worked out from Survey data, 2016

Based on employment type (Figure 3.14), there is variation in the average individual income levels. The three fishing activities, viz. Mechanized, Motorized and Traditional are male-centric and hence only one error bar for each is produced. Based on activity, the traditional or non-motorised fishers have the lowest average individual income, followed by the motorized and the

mechanized fishers. Even though the males in the other allied activities earn more than the non-motorised fishers on an average, the female earnings are lesser than the non-motorised earnings. Gender disparity in earnings is evident with females engaged in allied activities like fish vending, fishers SHG activity, processing, etc. earn lesser than the males.

Figure 3.14. Activity and Individual Income based on Gender
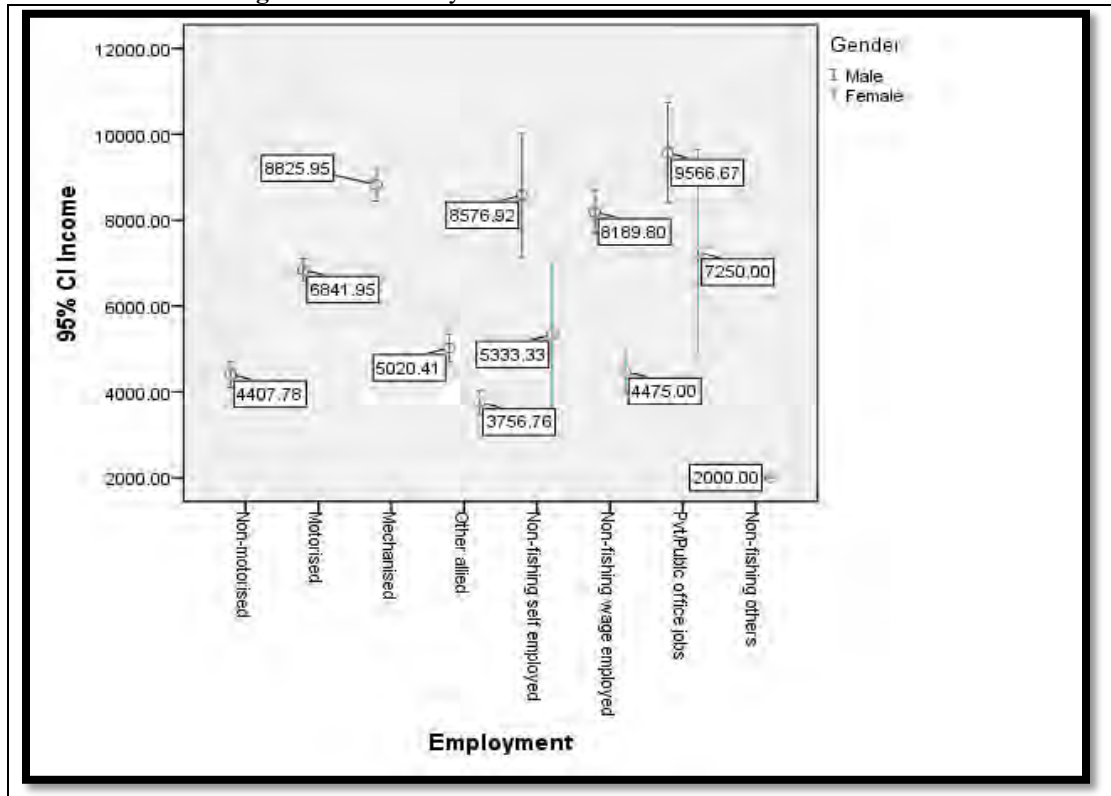
Source: Worked out from Survey data, 2016

3.10 Household Income and Expenditure

Evaluating the household income and expenditure shows that the average household spending is more than the household income (Figure 3.15). District-wise data also show the same inference with expenditure more than the income. The Ernakulam has the highest average household income, followed by Kollam and Kozhikode. The spending pattern also shows identical district-wise inference. The income-expenditure pattern shows that it is still valid with the adage that fishers live with high expectation and hence spending is more than earnings.

Figure 3.15. Household Income and Expenditure
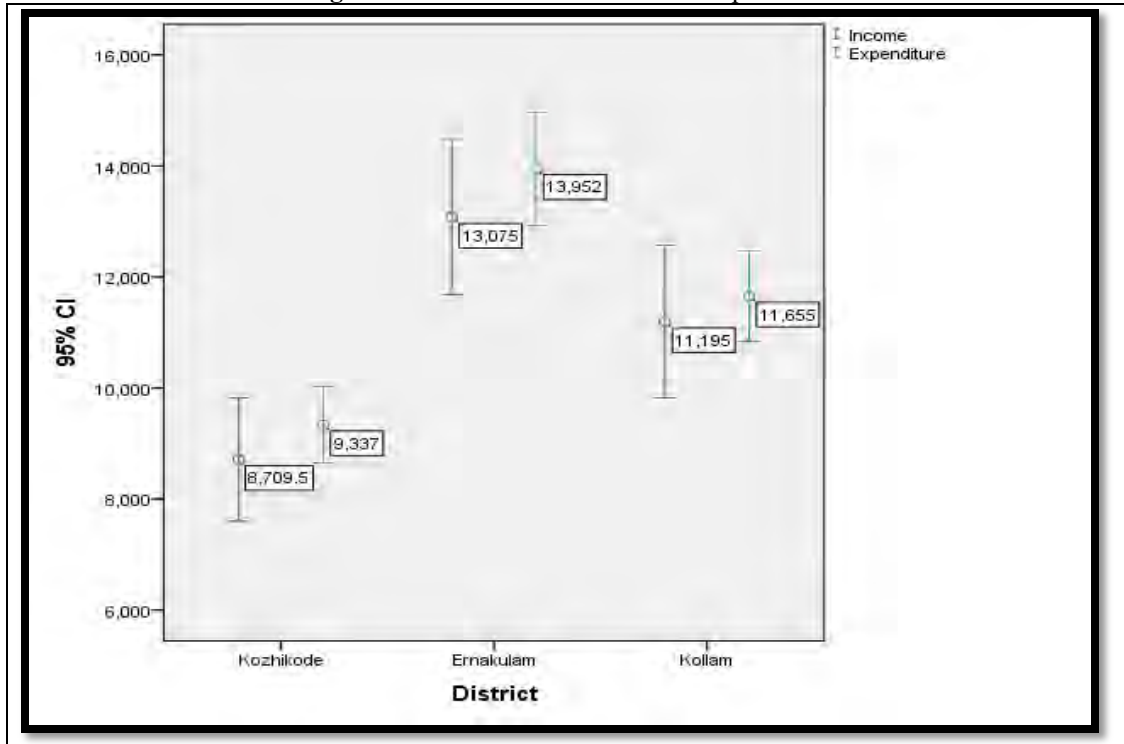
Source: Worked out from Survey data, 2016

To further test the district-wise differences in the household income, the ANOVA (Table 3.32) is used. The results are significant and hence the mean values of household income are significantly different for the three districts. However, from the ANOVA results, it is unknown that which mean values are different. To evaluate the same Duncan test is used which is depicted in Table 3.33. This shows that the three districts are not homogeneous subsets as per the results. The Kozhikode district is in subset 1 with the lowest mean value, Kollam in subset 2 and Ernakulam in subset 3.

Table 3.32. ANOVA: District and Household Income

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	958969850.000	2	479484925.000	11.224	.000
Within Groups	12687930450.000	297	42720304.545		
Total	13646900300.000	299			

Table 3.33. Duncan Test: District and Household Income

District	N	Subset for alpha = 0.05		
		1	2	3
Kozhikode	100	8709.5000		
Kollam	100		11194.5000	
Ernakulam	100			13075.0000
Sig.		1.000	1.000	1.000

Fisher households" per-capita income and expenditure are shown in Figure 3.16. It proves similar district-wise inferences as was with the individual and household income including household spending. Again the spending is more than the per-capita earnings for all the three districts. Earnings and spending of the Kozhikode fishers are low. This is because of low value species composition compared to Ernakulam and Kollam.

Figure 3.16. Per-capita Income and Expenditure
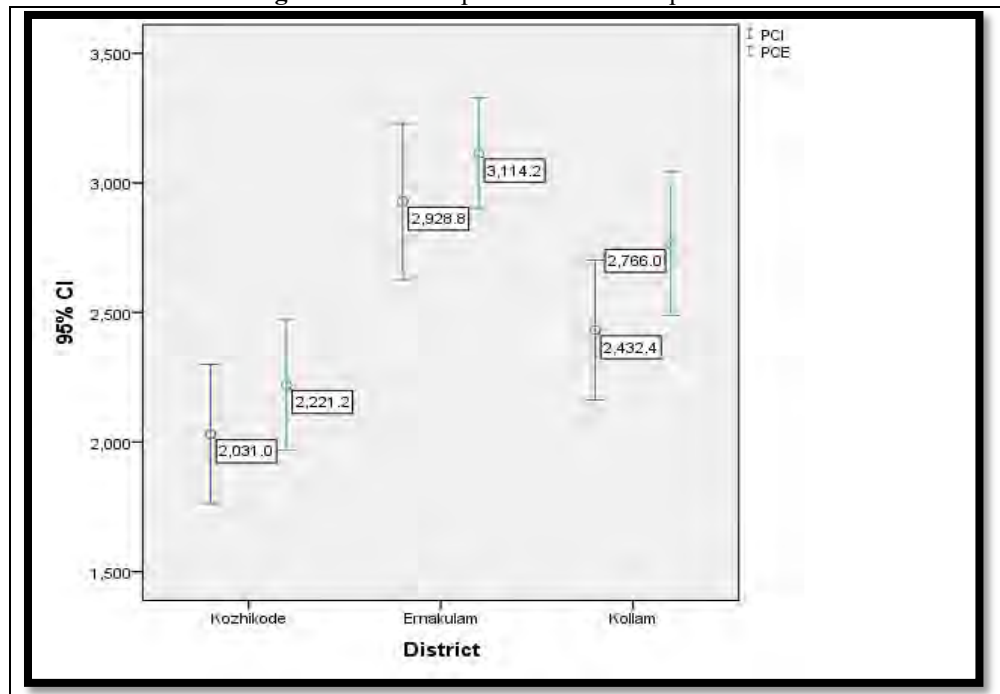
3.11   Financial Habits

Evaluations of the financial habits of the respondents like savings, indebtedness and its purpose, etc. are will help to situate the financial health of the households. Formal credit and financial habits have become predominant in sample districts, but Ernakulam shows better financial discipline than the other two districts and Kozhikode in particular.

3.11.1 Savings

Savings are pivotal in shaping the financial health of an individual. For communities like the fishers, who have risks and uncertainty associated with their occupation and earnings, even small amount of savings can be an advantage as they can use it during lean seasons or in the event of contingency like illness, for purchase or maintenance of equipments, house maintenance, etc. Figure 3.17 indicates that 68 percent of the fishers" households have some sort

72

of savings. District-wise Ernakulam has the highest savings rate (76 percent) and Kozhikode has the lowest.

Figure 3.17. Savings

	Kozhikode	Ernakulam	Kollam	Total
■ No	40	24	32	32
■ Yes	60	76	68	68
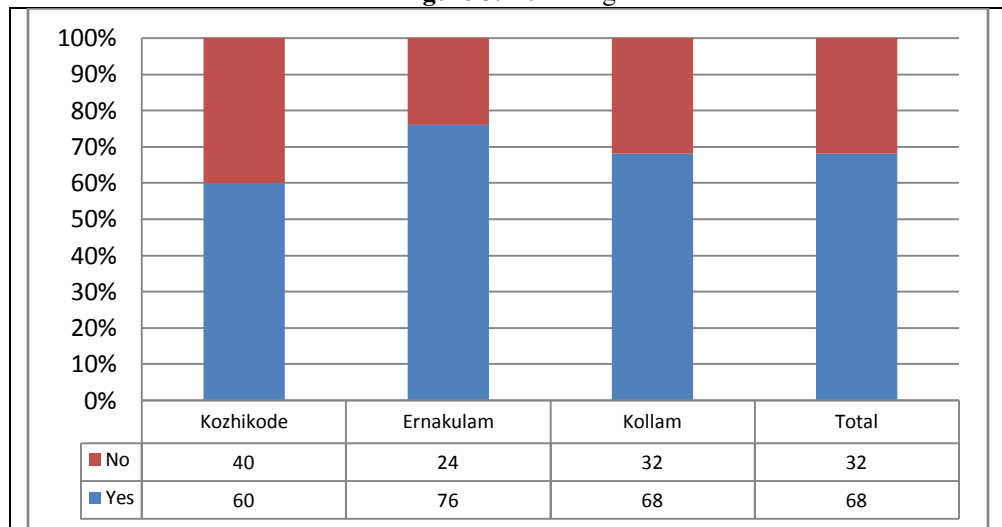
Source: Worked out from Appendix 3.7

Within the 69 percent households that have savings, 40 percent have regular savings. District-wise, nearly 50 percent of the households in Ernakulam have regular savings. In Kozhikode district, households that have regular savings are 32 percent and in Kollam 37 percent. Even though high savings rate is a good signal, the pattern of savings is mostly irregular owing to the erratic earning patterns. The district-wise saving pattern is given in Figure 3.18.

Figure 3.18. Saving Pattern
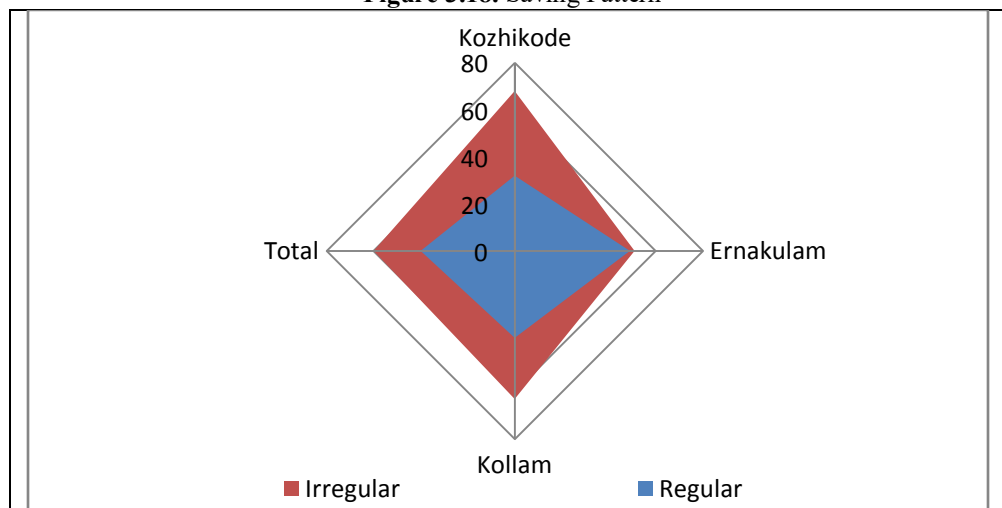
Source: Worked out from Appendix 3.8

Majority of the fisher households saves to meet the daily contingencies (Figure 3.19). They are of the opinion that the income is set aside to meet the day-to-day expenses during the lean seasons. Next they mainly save for meeting expenses of marriage and other functions in the

family. House construction/maintenance is yet another purpose of savings with percentage of households saving for construction of house high in Ernakulam. Savings for the purpose of education of household members is seemed to be very less.

Figure 3.19. Purpose of Savings
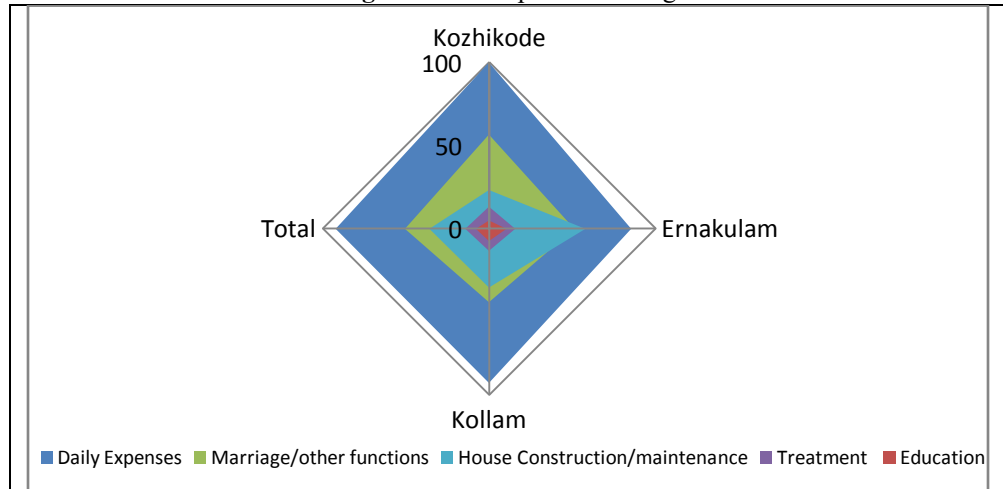
Source: Worked out from Appendix 3.9

Majority of the fishers has savings in the SHGs through cooperative societies (Figure 3.20). Most of the societies are coming under the Matsyafed. District-wise, Ernakulam has a healthy savings pattern which spread across an array of financial instruments and institutions like cooperatives, Chits, gold, post office, etc. District-wise saving instruments are almost similar. Often, the female members of the household take initiative for keeping a part of their earnings for future consumption or use. Even though their earnings are very less compared to the male members, they are able to save some part of their earnings. The male members, even with their high income, often spent lavishly on liquor, tobacco, etc. and hence are unable to save.

Figure 3.20. Saving Instrument
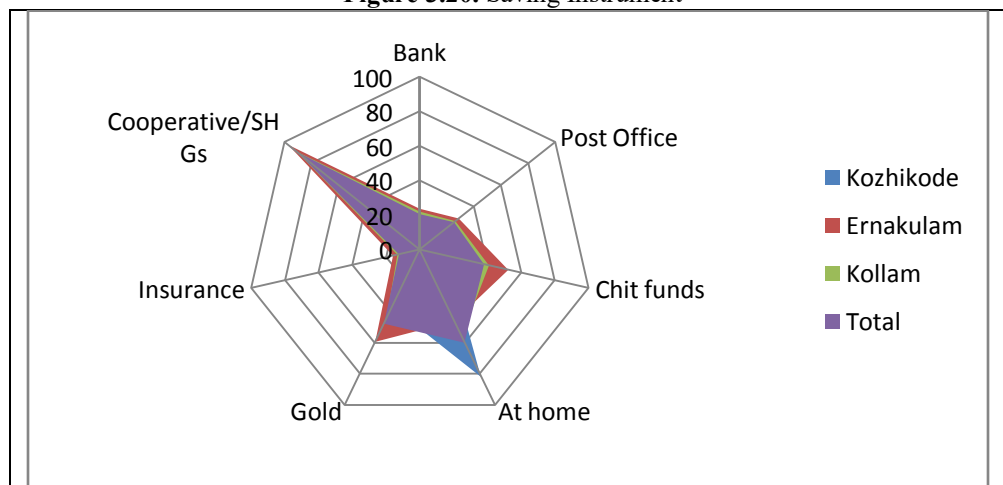
Source: Worked out from Appendix 3.10

74

3.11.2 Indebtedness

As the expenditure is higher than the income for most of the households, they often resort to borrowings from friends, cooperatives, and other formal and informal channels. Difficulty in accessing formal credit has been termed as a major issue among the fishers and the lack of household assets worsens this issue. Their over dependence on private money lenders is often termed as high and has been cited as major reason for indebtedness that has been shifting from generations to generations. However, the situation has shown some positive changes due to the emergence of formal credit institutions through the Cooperative movement by the Matsyafed.

Figure 3.21. Debt
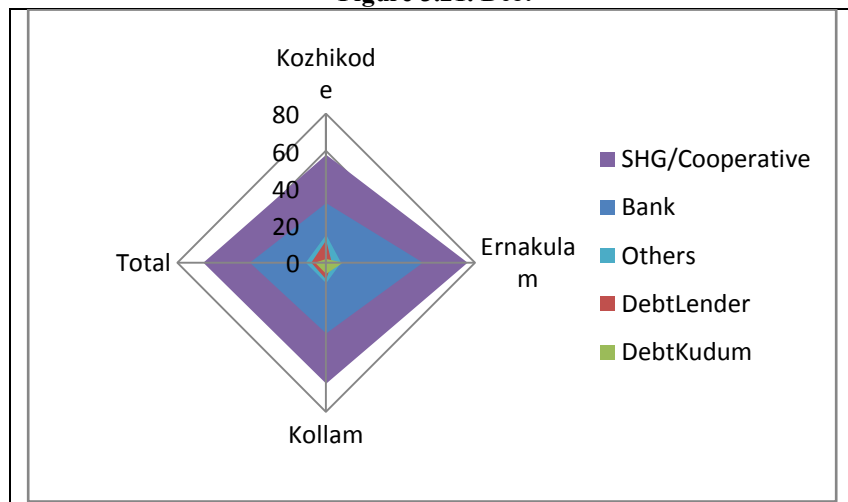
Source: Worked out from Appendix 3.11

District-wise debt details (Figure 3.21) show that the Cooperatives which are constituted by the Matsyafed are the major source of borrowings for the fisher folks. These institutional linkages have been at the forefront in the coastal belts of Kerala for ensuring financial services like access to formal credit to the fishers. The penetration of Kudumbashree SHGs is very less among the marine fishing villages. However, the percentages depending on the Kudumbashree are higher in Ernakulam. Majority fishers depend on the cooperative society (directly from society or through SHG-Cooperative linkages of Matsyafed) for their borrowing needs, followed by banks. Only 8 percent of the households mainly depend on money lenders. The second major source for the fishers is banks (especially cooperative banks). They depend on bank loans for requirements like house construction or maintenance, marriage and other functions, daily spending, etc. Here, it can be identified that the access to credit from scheduled commercial banks is very less. It is obvious that the rate of interest charged by these banks is slightly higher. Barring for daily spending, the dependence of fishers on informal channels is very less. Field

inference shows high gendered inference with regard to the dependence on the Matsyafed SHG/Cooperatives and Kudumbashree SHGs in Ernakulam and Kollam with high participation of the female members. This is akin to the inference obtained with regard to the savings of the households.

3.12 Income Inequality

A comparison of income inequality in the three districts based on the household income with the aid of Gini Coefficient (GC) values shows that overall GC value is 0.321. Kollam"s level of inequality is similar to the total Gini value. Ernakulam and Kozhikode have almost similar levels of GC values. Even though in terms of Gini value, Kollam district has the highest inequality in income compared to the other two regions, the overall inequality levels are almost identical. This implies that within the district the inequality is almost similar (Table 3.34).

Table 3.34. Gini Coefficient

Total	0.321566
Ernakulam	0.290473
Kozhikode	0.29654
Kollam	0.326423

Source: Worked out from the Survey data, 2016

3.13 Poverty

The poverty level of the 300 households in the three districts is evaluated by analyzing the household per-capita income and expenditure. As it was already inferred that the spending is higher than the income, hence the income poverty is higher than the expenditure poverty. Based on this 9 percent of the households are below poverty line on income levels, whereas the same based on the per-capita household spending, it is only 4.3 percent. District-wise, Kozhikode has the highest number of households below the critical level of poverty based on PCI (14 percent) and PCE (9 percent). Ernakulam has the lowest number of BPL households based on household per-capita expenditure (1 percent) and income (4 percent). The income and expenditure poverty levels are shown in Figure 3.22. The main activity of the poor households is non-motorised fishing and other allied fishing activities.

The poverty level among the fishers as per the sample data is very low; their major issue is uneven earnings, especially during lean periods. Some of the sub-sectors like the mechanized boats are not allowed to go for fishing during this period. The fishers in those boats either work in other sub-sectors like motorized and other activities or do not have any earnings during this

period. In terms of earnings, the trawl ban period is the most difficult season for the fishing households and hence they get only low earnings.

Figure 3.22. Poverty

	Kozhiko de MPCE Poor	Ernakul am MPCE Poor	Kollam MPCE Poor	Total MPCE Poor	Kozhiko de PCI Poor	Ernakul am PCI Poor	Kollam PCI Poor	Total PCI Poor
■ Yes	9	1	3	4	14	4	9	9
■ No	91	99	97	96	86	96	91	91
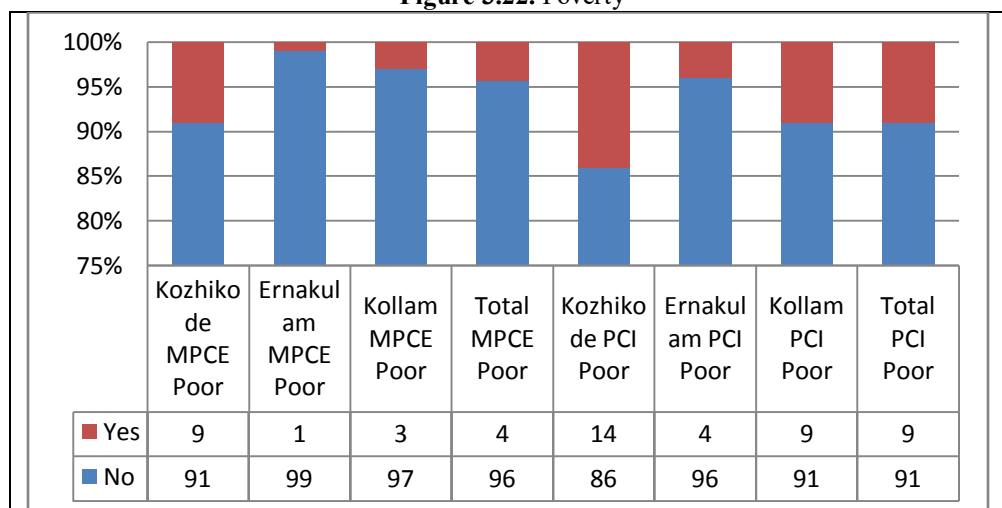
Source: Worked out from Appendix 3.12

To work out the relative poverty, Foster-Greer-Thorbecke [FGT] (1984) analysis is used. Incidence of Poverty Index or Head Count Index (HCI) and Relative Incidence of Poverty have also been computed. Appraising the depth of Poverty Gap Index (PGI) and severity of poverty (SPGI) is important in designing plans aimed at reducing the number of people living below the poverty line. The FGT is based on the property of being additively sub-group decomposable. This means that the index is decomposable by sub-groups among the poor. This method helps to identify the relative position of each group in terms of poverty (Table 3.35).

Table 3.35. Relative Poverty

District	HCI	Rel.inci.	PGI	SPGI
Kozhikode	0.099	2.18	0.0162	0.0057
Ernakulam	0.010	0.22	0.0060	0.0037
Kollam	0.031	0.68	0.0059	0.0018
Total	0.045	1.00	0.0094	0.0037

Note: The general form of FGT is given in Appendix 3.13

Even though the poverty indicators are not so severe, the Kozhikode district has the highest values in terms of the four indicators, whereas the Ernakulam has the lowest values for the first three indicators. Nonetheless, the Kollam district has poorer indicators than Ernakulam in terms of HCI, relative incidence and PGI the severity of poverty in Ernakulam is higher. This is because the main activity of the poor household in Ernakulam is engaged in the traditional activities and hence has high severity of poverty.

77

The basic indicators based on primary data in Chapter 3 render clear improvement in comparison to the temporal secondary data. But education level of the fishers has not been improved to the desired level as per the education spurt that has happened in Kerala in the recent decades. This has made the fishers still sticky in their traditional avocation though the younger household members desire for a change. This prevents their upward movement in the family status through change in employment status and increased asset procurement. The Standard of Living Index also exhibits the pattern of change of a community from nothing to a slightly progressive level. The sample data show the evidence of low level of poverty but their situation becomes awfully deplorable during trawl ban periods and other lean seasons. With this analytical rigor regarding the family status and socio economics of the fishers it is useful to evaluate the fishers perception in the areas of livelihood and employment changes in the globalised fishery scenario based on sample data in Chapter 4.

Chapter 4

Fishers Perception and Livelihood and Employment Changes in the Globalised Fishery Scenario

Stakeholder‟s perception is valuable in evaluating the dynamics of a sector purely endowed with expectations of unforeseen fortunes. But the link between resources, livelihood and employment with more and more capital infusion has not changed their socio economics to the expected levels as has already been well articulated in Chapter 3. The globalization impact in the fishing sector is multifarious and it has manifested first in the form of technology and soon in the form of resource depletion and thereby generating livelihood and employment changes. Chapter 4 is an effort to analyze the changes in employment and its vicissitudes during the trawl ban in the fishing sector with the help of primary data.

4.1   Perception of the Fishers

Trawl ban in Kerala during monsoon has been done with the objective of resource sustainability since 1988. But the recent ban (2015) is connected to total coastal area for 60 days in India, though this was not implemented in its total spirit by the Kerala Government. The evaluation of catch structure temporally during the pre and post ban periods in Chapter 2 highlights that the trawl ban has positively influenced the resource sustainability of the Kerala marine fisheries. However, it has created livelihood insecurity of the fishers. Though it is only for a short period of 60 days its impact on the fisher‟s households is disadvantageous.

The livelihood options for the fishers are scant due to the low education status and lack of skill to migrate into other employment avenues. Their main employment option is related to fishing and hence during monsoon trawl ban period majority does not go for other jobs. Mechanized fishers in some cases temporarily migrate to other sub-sectors creating a situation of underemployment.

4.1.1   Perception about Fishing and its prospects

Fishing and allied activities are still the most available income earnings option to the fishers‟ households. The majority of the fishers irrespective of their sub-sectors desires to shift to any non-fishing avocation but is unwilling or fails to do so because of the lack of income earning avocation other than fishing in the fishing villages. The inference relating to fishers response for

a permanent shifting from fishing operations to non-fishing activity shows that 86 percent of the fishers are unwilling to shift. The district-wise analysis in Table 4.1 and Figure 4.1 shows that 10 percent in Kozhikode, 14 percent in Kollam and 20 percent in Ernakulam fishers are willing to shift to non-fishing.

Table 4.1. Willingness to Shift to Non-fishing

District	Willing			No Skill	Fishing is more profitable	Lack of other avenues	Community status problems	Others
	No	Yes	*Reason for not shifting*					
Kozhikode	90	10		89	7	83	4	4
Ernakulam	80	20		79	4	31	0	2
Kollam	86	14		80	4	45	0	2

Source: Survey data, 2016

Figure 4.1. Reason for not shifting to Non-fishing
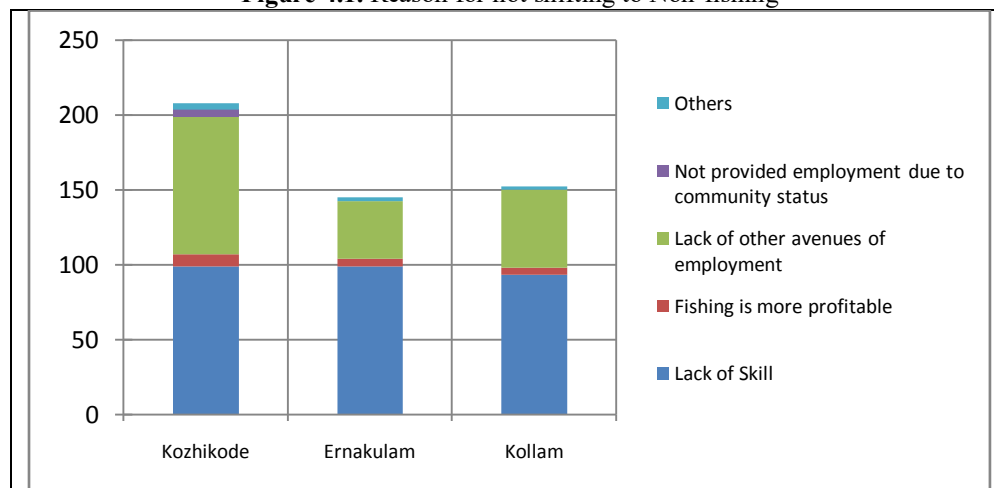
Source: Worked out from Table 4.1

The main reasons cited for not shifting to non-fishing are mainly lack of requisite skills for making a shift. The second major reason citied is the lack of adequate employment options. This however shows some inter-district variation as more fishers in Kozhikode cite this as major reason compared to Kollam and Ernakulam. In Kollam and Ernakulam districts, the availability of employment options but they do not have skills to take up the available opportunity. But the elder fishers are more reluctant compared to the new generation fishers. A few fishers still believe this as a lucrative and interesting work area. But the redundancy of randomness and erratic pattern of earning and income loss during trawl ban still have issues among fishers and fishers-households. The fisher's opinion about less attraction for fishing is the risks of loss of fishing assets and life during fishing activities. But field inference points out that they are reluctant to send their children in the fishing activities.

4.1.2   Perception about Trawl Ban

The perception of fishers relating to trawl ban implies that. 85.7 percent feel that the ban of trawling is the most useful way to achieve resource sustainability. 84 percent of the fishers in Kozhikode have opined that the trawl ban is essential for resource sustainability. The fishers in Ernakulam perceive slightly higher with 91 percent and Kollam fishers with 82 percent only.

Table 4.2. Need of Trawl Ban for Resource Sustainability

			Need of Trawl Ban for Resource Sustainability		Total
			No	Yes	
District	Kozhikode	Count	16	84	100
		% within District	16.0	84.0	100.0
	Ernakulam	Count	9	91	100
		% within District	9.0	91.0	100.0
	Kollam	Count	18	82	100
		% within District	18.0	82.0	100.0
Total		Count	43	257	300
		% within District	14.3	85.7	100.0

Source: Survey data, 2016

In terms of livelihood and food security issues 75 percent of the fishers feel that the trawl ban is a temporary threat to their livelihood security (Table 4.3) with a good spatial difference. 96 percent of the fishers feel that the trawl ban has impacted their livelihood.

Table 4.3. Impact of Trawl Ban on Livelihood

			Impact on Livelihood		Total
			No	Yes	
District	Kozhikode	Count	4	96	100
		% within District	4.0	96.0	100.0
	Ernakulam	Count	39	61	100
		% within District	39.0	61.0	100.0
	Kollam	Count	32	68	100
		% within District	32.0	68.0	100.0
Total		Count	75	225	300
		% within District	25.0	75.0	100.0

Source: Survey data, 2016

The livelihood impact during trawl ban as per the five point scale (1 denoting the highest impact and 5 lowest impacts) is given in Table 4.4 and Figure 4.2. This shows visible inter-district variation.

Table 4.4. Ranking the Impact of Trawl Ban on Livelihood Security

			Impact					Total
			Very high	High	Moderate	Low	Very low	Total
District	Kozhikode	Count	40	49	4	3	0	96
		% within District	41.7	51.0	4.2	3.1	0.0	100.0
	Ernakulam	Count	18	10	15	18	0	61
		% within District	29.5	16.4	24.6	29.5	0.0	100.0
	Kollam	Count	22	9	6	28	3	68
		% within District	32.4	13.2	8.8	41.2	4.4	100.0
Total		Count	80	68	25	49	3	225
		% within District	35.6	30.2	11.1	21.8	1.3	100.0

Source: Survey data, 2016

It has severely affected the majority of the fishing communities with very high impacts (35.6 percent) or high impacts (30.2 percent). 41.2 fishers in Kollam have ranked the impact at a low level, whereas 32.4 percent in the district view that the trawl ban has very high impact on their livelihood.

Figure 4.2. Ranking the Impact of Trawl Ban
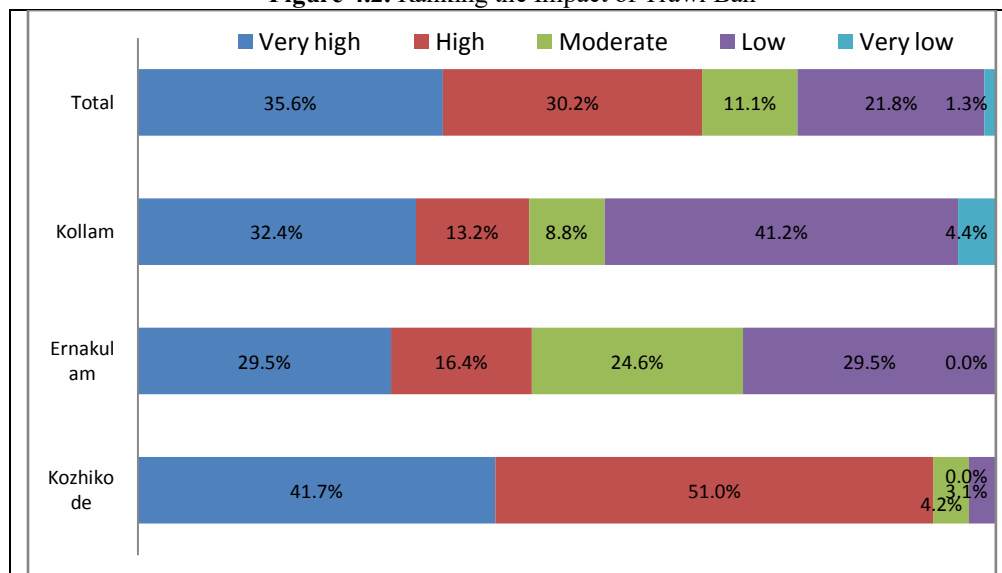
Source: Worked out from Table 4.4

Perception of the fishers relating to food and nutritional security shows that trawl ban has negatively impacted the food and nutritional intake of the fishers-households. But this too varies regionally as given in Table 4.5. A general change in food consumption pattern has been cited as a major impact of the trawl ban for 56 percent of the fishers. However, the concern is much higher (72 percent) in the northern region, (Kozhikode) compared to the south and central districts. This change in the food consumption pattern leads to nutritional and health problems.

Table 4.5. Impact of Trawl Ban on Food Consumption

			Changes in food consumption pattern		Total
			No	Yes	
District	Kozhikode	Count	28	72	100
		% within District	28.0	72.0	100.0
	Ernakulam	Count	54	46	100
		% within District	54.0	46.0	100.0
	Kollam	Count	50	50	100
		% within District	50.0	50.0	100.0
Total		Count	132	168	300
		% within District	44.0	56.0	100.0

Source: Survey data, 2016

4.1.3 Perception about Technological Change and Resource Sustainability

Analyzing the post 1950s technological change in the resource based sectors of Kerala, the fishing sector is peculiar with sporadic changes of technology useful to a certain faction and unwanted to most of the real fishers. Hence the Kerala fish economy has witnessed the formation of several sub-sectors like the non-motorized, motorized and the mechanized. The major craft-gear combinations of these sub-sectors are given in Box 4.1.

Box. 4.1. Craft-gear combinations in Kerala Marine Fisheries

Craft	Gear
Mechanised fleet	
1. Mechanised Trawlers Small (8.5-9.7 m LOA; 90 hp) Medium (9.7-16.7 m LOA; 100-158 hp) Large (16.7-21 m LOA; 177 hp)	Shrimp trawls - 5 types, Fish trawls-3 types, Cephalopod trawl-1 type, gastropod trawl-1 type
2. Mechanised Gill-netter-liner (9.7-21 m LOA; 110-140 hp)	Gillnets; longlines; handlines
3. Mechanised Purse seiner (15.2-16.7 m LOA; 110-156 hp)	Large mesh (45 mm) purse seines for tuna, seerfish, mackerel and carangids
Motorised (IBM or OBM) Traditional fleet	
4. Crafts with inboard engine (steel or wood hull; 18.3-25.8 m LOA; 90-140 hp)	Ring seines (18 mm mesh) for sardines and mackerel
5. Crafts with OBM (wood, steel fibreglass hull); 12.2-21.3 m; 22+22 hp, 40+22 hp, 40+22+22 hp, 40+40+22 hp or 40+40+40 hp	Ring seines (18 mm mesh size) for sardines, mackerel, carangids and prawns
6. Crafts with OBM (wood and fibreglass hull; 9.9-22 hp)	Ring seines (8-12 mm) for anchovies; Mini trawls; Gillnets; Hooks and Lines; Encircling nets; Boat seines; Shore seines
Non-Motorised traditional Fleet	
7. Catamaram Plank canoe, Dugout canoe FRP canoes	Encircling nets; boat seines; Shore seines; Gillnets; Hooks and lines; Cast nets

Source: Pillai, et. al, 2009

Based on the craft gear combination the major contributor of output in Kerala comes from motorized and mechanized sectors using ring seines and trawl nets. But other types of gears like gillnet, hooks and line, boat seines and purse seines have also been widely used by the fishers with some regional differences in its applications.

Though fishers perceive highly that trawl ban helps in resource sustainability, fishers perception is in reverse level with respect to livelihood and food security. This kind of direct and inverse relationship and its dynamics of technological advancement are given in Table 4.6. This is well perceived by 90 percent of the respondents as technological advancement has negatively impacted the fisheries sector. Regionally this kind of negativity is mostly opined by the Kozhikode fishers, but this thinking is less in Ernakulam and Kollam districts (80 and 85 percentages respectively).

Table 4.6. Technological Advancement and Fisher folks

			Impact of Technological Advancement on the Fisheries		Total
			No	Yes	
District	Kozhikode	Count	3	97	100
		% within District	3.0	97.0	100.0
	Ernakulam	Count	20	80	100
		% within District	20.0	80.0	100.0
	Kollam	Count	15	85	100
		% within District	15.0	85.0	100.0
Total		Count	38	262	300
		% within District	12.7	87.3	100.0

Source: Survey data, 2016

A noticeable feature in the fishing sector recently is the change from the local based fishing landing to centralise landings. This has created livelihood issues to the head load fisher-women as they have to travel long distance to collect fish for vending. To overcome the trouble connected with this the government introduced several schemes and assistances for the women fish vendors with transportation facilities including special buses to fisher-women for fish marketing.

Major impact in the fishing sector recently is the decline in landing of most of the species and in this some are in the total extinction. The perception of fishers in this aspect is illustrated in Table 4.7. This is relevant in the post ban output spurt period also. The availability of sardines, mackerel, etta, etc. have come down which affects the cheap food and protein security of the local poor people. The reasons are manifold but most of these are manmade in the form of

unsustainable fishing practices like night-trawling, purse-seining, indiscriminate deep sea fishing done by the large vessels in the in the off-sea areas.

Table 4.7. Non-availability of some species

			Loss of species		Total
			No	Yes	
District	Kozhikode	Count	8	92	100
		% within District	8.0	92.0	100.0
	Ernakulam	Count	1	99	100
		% within District	1.0	99.0	100.0
	Kollam	Count	3	97	100
		% within District	3.0	97.0	100.0
Total		Count	12	288	300
		% within District	4.0	96.0	100.0

Source: Survey data, 2016

4.2 Impact of Trawl Ban on Livelihood

The imminent impact of trawl ban mostly comes in the form of new change in employment of fishery household members as depicted in Figure 4.3. The employment pattern as per the fishers view is worst in the case of mechanized fishers with 64.6 percent. This is worrisome considering the contribution of the mechanized fishers in household income in non-trawl ban seasons.

Figure 4.3. Activity during Trawl ban
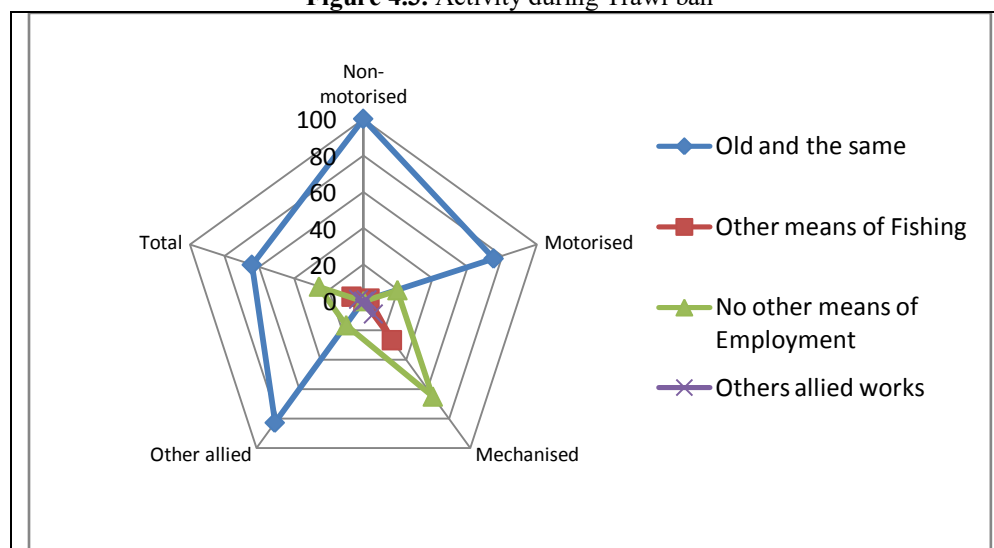
Source: Worked out from the Survey data, 2016

Table 4.8 highlights that employment blow is more among the male-fishers than the female-fishers. This is because most of the females work in allied sectors like fish vending, sale of dried fish, pickles, etc. or in prawn pealing and other pre or post harvest sectors. 89.2 percent of the

fisherwomen have the same income earning avenue during the trawl ban compared to 61.7 percent males.

Table 4.8. Current Year Employment during Trawl Ban

			Employment				
			Old and the same	Other means of Fishing	No other means of Employment	Others allied works	Total
Gender	Male	Count	214	27	95	11	347
		% within Gender	61.7	7.8	27.4	3.2	100.0
	Female	Count	33	0	4	0	37
		% within Gender	89.2	0.0	10.8	0.0	100.0
Total		Count	247	27	99	11	384
		% within Gender	64.3	7.0	25.8	2.9	100.0

Source: Survey data, 2016

The main household activity during the trawl ban period is evaluated on a temporal basis for further periods of 5 years back, 10 years back and 20 years back with the aid of recall memory of the respondents. Recall history is often difficult particularly in the case of a community with less education and also living with uncertain employment and income. However, the field inferences and discussions with the elders in the fishing villages have generated similar inferences irrespective of regions.

The dependence on fishery and allied activities is more than 90 percent in most of the cases for the males and 100 percent for females (Table 4.9). For Kozhikode and Kollam districts, the percentage is nearly 100 percent with no improvement inter-temporally; the situation in Ernakulam has improved from 93.6 percent in 20 years back to 90 percent in the last year based on their dependence on fisheries and allied works during trawl ban.

Table 4.9. Temporal Household Employment during Trawl Ban period (in percent)

Male				
District	LY	5Y	10Y	20Y
Kozhikode	99.0	100.0	100.0	100.0
Ernakulam	90.0	93.8	93.6	93.3
Kollam	100.0	100.0	100.0	100.0
Total	98.0	97.9	97.8	97.8
Female				
Kozhikode	100.0	100.0	100.0	100.0
Ernakulam	92.9	100.0	100.0	100.0
Kollam	100.0	100.0	100.0	100.0
Total	94.6	100.0	100.0	100.0

Source: Survey data, 2016

4.3   Impact of Trawl Ban on Income

Livelihood and employment evaluation during trawl ban prove that mechanized fishers face major setback. This is further used to identify its impact in the changes in earning pattern and also in household income of the fishers.

Table 4.10. District and Individual Income Category

District	Particulars	Income					Total
		Below 2500	2501-5000	5001-7500	7501-10000	Above 10000	
(a) Individual Income							
Kozhikode	Count	4	36	57	20	5	122
	% within District	3.3	29.5	46.7	16.4	4.1	100.0
Ernakulam	Count	1	51	21	52	7	132
	% within District	.8	38.6	15.9	39.4	5.3	100.0
Kollam	Count	0	47	54	28	1	130
	% within District	0.0	36.2	41.5	21.5	.8	100.0
Total	Count	5	134	132	100	13	384
	% within District	1.3	34.9	34.4	26.0	3.4	100.0
(b) Trawl Individual Income							
Kozhikode	Count	38	45	32	7	0	122
	% within District	31.1	36.9	26.2	5.7	0.0	100.0
Ernakulam	Count	40	54	13	20	5	132
	% within District	30.3	40.9	9.8	15.2	3.8	100.0
Kollam	Count	29	44	42	11	4	130
	% within District	22.3	33.8	32.3	8.5	3.1	100.0
Total	Count	107	143	87	38	9	384
	% within District	27.9	37.2	22.7	9.9	2.3	100.0

Source: Survey data, 2016

Table 4.11. Activity and Individual Income Category

Employment	Particulars	Income					Total
		Below 2500	2501-5000	5001-7500	7501-10000	Above 10000	
(a) Individual Income							
Non-motorised	Count	2	36	6	1	0	45
	% within Employment	4.4	80.0	13.3	2.2	0.0	100.0
Motorised	Count	0	34	87	53	0	174
	% within Employment	0.0	19.5	50.0	30.5	0.0	100.0
Mechanised	Count	0	0	21	45	13	79
	% within Employment	0.0	0.0	26.6	57.0	16.5	100.0
Other allied	Count	3	64	18	1	0	86
	% within Employment	3.5	74.4	20.9	1.2	0.0	100.0
Total	Count	5	134	132	100	13	384
	% within Employment	1.3	34.9	34.4	26.0	3.4	100.0
(b) Trawl Individual Income							
Non-motorised	Count	2	35	7	1	0	45
	% within Employment	4.4	77.8	15.6	2.2	0.0	100.0
Motorised	Count	35	30	64	36	9	174
	% within Employment	20.1	17.2	36.8	20.7	5.2	100.0
Mechanised	Count	52	25	2	0	0	79
	% within Employment	65.8	31.6	2.5	0.0	0.0	100.0
Other allied	Count	18	53	14	1	0	86
	% within Employment	20.9	61.6	16.3	1.2	0.0	100.0
Total	Count	107	143	87	38	9	384
	% within Employment	27.9	37.2	22.7	9.9	2.3	100.0

Source: Survey data, 2016

The individual income during trawl ban and non-trawl ban fishing periods is shown in Figure 4.4. Majority of the fishers during the period is in the income slab of Rs. 2500-7500. During the trawl ban period the individual income has come down to below Rs. 2500 and 2500-5000 levels.

Figure 4.4. Individual Income Category
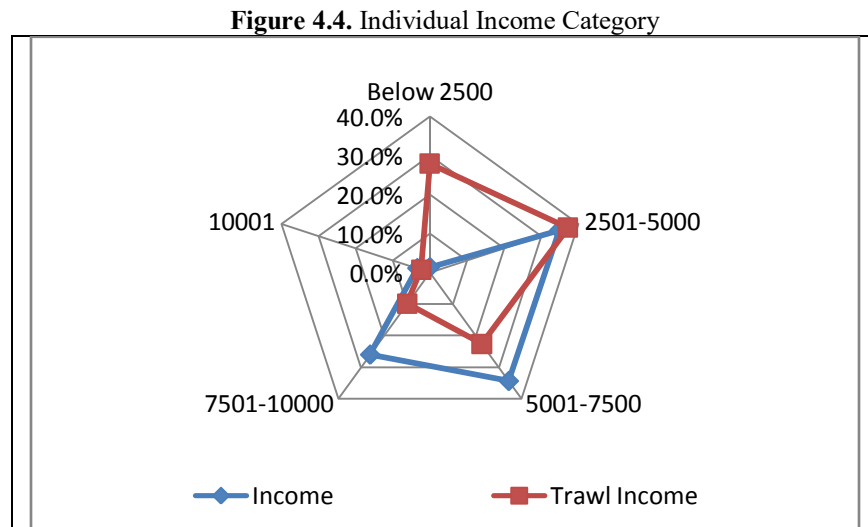
Source: Worked out from Table 4.10 and 4.11

The individual income category during non-trawl ban period and the trawl ban period is evaluated both district-wise and activity-wise (Tables 4.10 and 4.11). Higher income level of 10000 and above earners irrespective of the district come only to 2.3 percent, but no one from Kozhikode has 10000 or above income level during trawl ban period and hence most are coming in the income slab of below Rs. 5000. Sector-wise impact in income earning shows that the mechanized fishers face the brunt of the income earning issue as they come mostly in the income group of more than Rs. 7500. This has also affected their earning levels as well.

To further understand this difference, the average individual earnings for the two periods are shown in Figure 4.5. The income levels for the non-motorised sector have shown a slight increase in the earnings during the trawl ban period. Irrespective of districts, the income levels during trawl ban is the lowest for the mechanized fishers. From the most promising income earning avocation, this sub-sector has turned into an unattractive sub-sector and has generated the lowest mean income value for all the three districts during the trawl ban period.

Figure 4.5. Average Individual Income Comparison
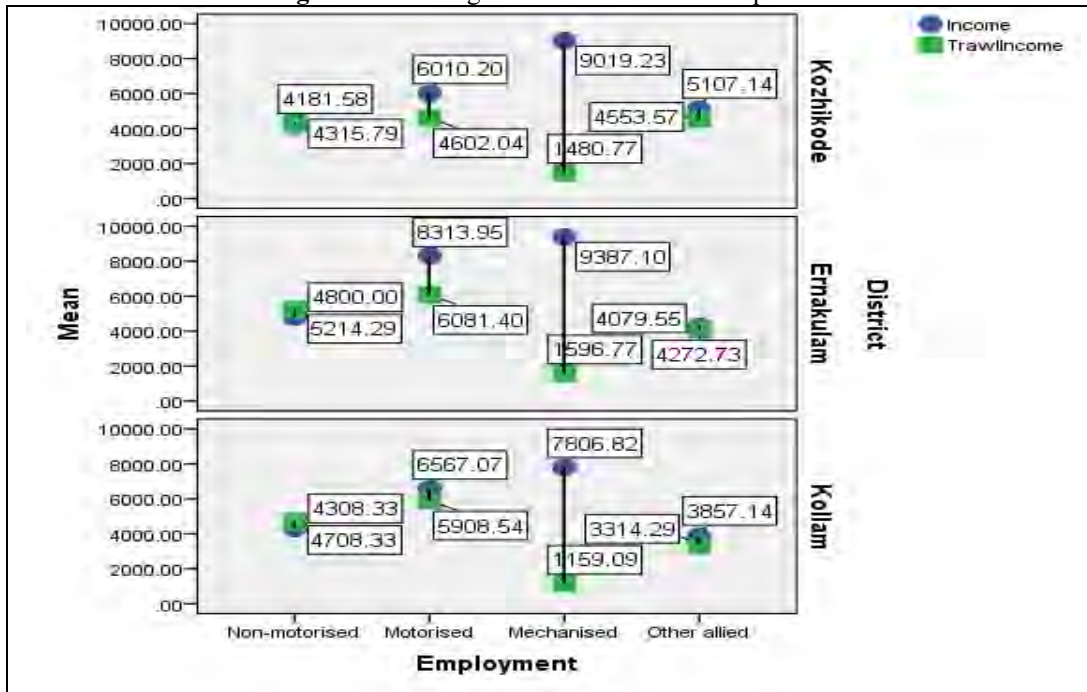
Source: Worked out from the Survey data, 2016

Table 4.12. Average Individual Income Change

District	Employment	Income	Trawl Income	% Change
Kozhikode	Non-motorised	4181.58	4315.79	3.94
	Motorised	6010.20	4602.04	-24.42
	Mechanised	9019.23	1480.77	-82.09
	Other allied	5107.14	4553.57	-9.88
	Total	6159.43	3881.15	-28.96
Ernakulam	Non-motorised	4800.00	5214.29	8.79
	Motorised	8313.95	6081.40	-28.75
	Mechanised	9387.10	1596.77	-82.05
	Other allied	4272.73	4079.55	-4.76
	Total	6846.21	4268.94	-29.29
Kollam	Non-motorised	4308.33	4708.33	9.98
	Motorised	6567.07	5908.54	-9.59
	Mechanised	7806.82	1159.09	-84.79
	Other allied	3857.14	3314.29	-12.21
	Total	6276.54	4714.62	-20.80
Total	Non-motorised	4407.78	4700.00	7.06
	Motorised	6841.95	5583.33	-18.50
	Mechanised	8825.95	1436.71	-82.83
	Other allied	4476.74	4109.30	-7.64
	Total	6435.16	4296.61	-26.31

Source: Worked out from the Survey data, 2016

The mean income level during non trawl ban and trawl ban periods and the average percentage change in income is shown in Table 4.12. Percentage-wise also the fall in income is more visible in the mechanized sector during trawl ban in comparison to other sub-sectors. In

89

this comparison it is clear that the impact is less in the non-motorized and other allied sectors, whereas the non-motorised sector shows a positive shift in earnings. The ban on trawling also shows high changes in the household earnings. Irrespective of the regions under analysis, the average household earnings has come down drastically. However, Ernakulam stands different in this respect regionally with high mean household income followed by Kollam and Kozhikode (Figure 4.6).

Figure 4.6. Average Household Income Comparison
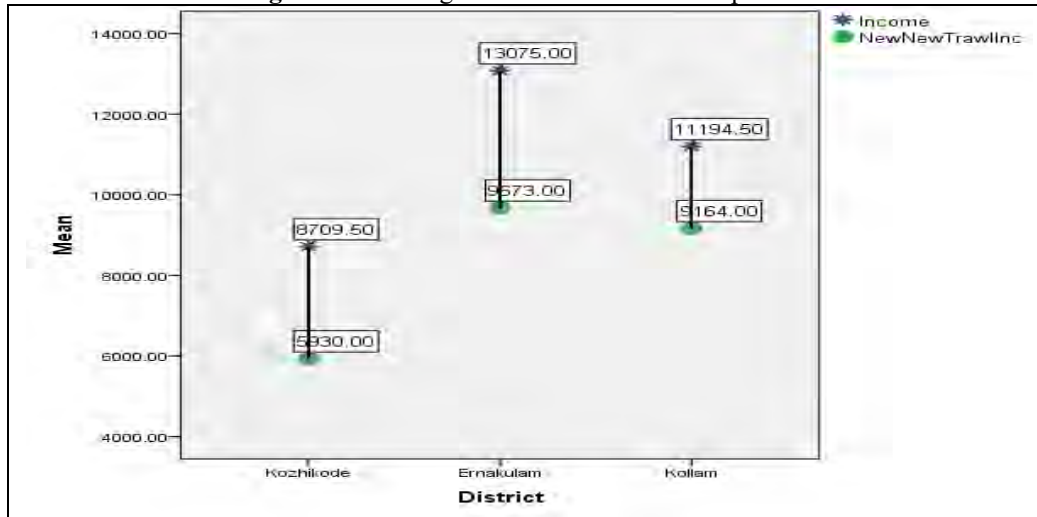
Source: Worked out from the Survey data, 2016

.**Figure 4.7.** Share of Individual Income on the Household Income
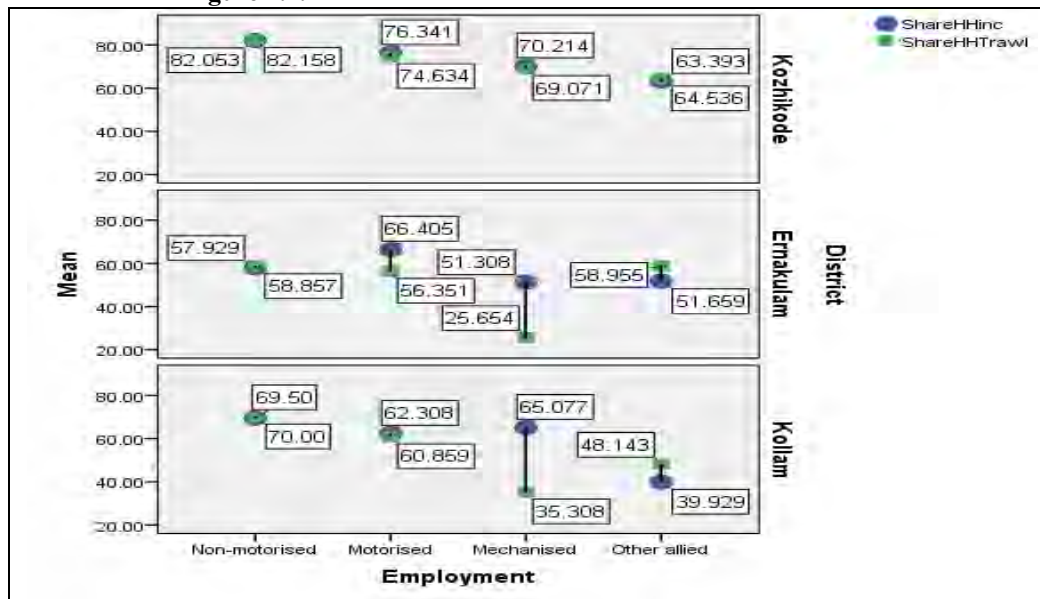
Source: Worked out from the Survey data, 2016

The percentage share in the household earnings during the non trawl ban and trawl ban periods shows noticeable variation in the mechanised sector (Figure 4.7 and Table 4.13). During

90

the non trawl ban period, the non-motorized sector has an average share of 71.20 percent, whereas that of motorized, mechanised and other allied sectors has respectively 69.49, 72.38 and 53.57. While the share of other allied and non-motorised sector has slightly increased, the share of motorised sector has shown a marginal fall. Because of higher number of household members engaged in other sub-sectors and also in non-fishing activities the decline in the share of earnings is detectable in Ernakulam and Kollam compared to Kozhikode.

Table 4.13. Share of Individual Income to Household Income

District	Employment	Normal	Trawl Ban
Kozhikode	Non-motorised	82.05	82.16
	Motorised	78.16	74.63
	Mechanised	83.96	69.07
	Other allied	63.39	64.54
	Total	76.61	72.50
Ernakulam	Non-motorised	57.93	58.86
	Motorised	69.81	56.35
	Mechanised	57.71	25.65
	Other allied	51.66	58.95
	Total	59.66	50.99
Kollam	Non-motorised	69.50	70.00
	Motorised	64.15	60.86
	Mechanised	79.36	35.31
	Other allied	39.93	48.14
	Total	64.61	57.44
Total	Non-motorised	71.20	71.67
	Motorised	69.49	63.41
	Mechanised	72.38	39.49
	Other allied	53.57	59.01
	Total	66.72	59.66

Source: Worked out from the Survey data, 2016

4.4   Poverty Impacts of Trawl Ban

Poverty impact of the sample household is evaluated based on household per-capita income during the trawl ban period. The analysis gives the picture of perpetual exit and entry into poverty traps. From a better off position during the non-ban periods, the households most often enter into severe poverty levels. This is evidentially high among the mechanised fisher-households. As in the case of overall poverty levels irrespective of trawl ban period or not the percentage of poor during the trawl ban is also high in Kozhikode fisher-households (44 percent), whereas for Ernakulam and Kollam the poverty levels during the trawl ban period respectively are 25 and 24 percents. Table 4.14 shows the detailed results of income poverty among the fishers during the trawl ban period. A comparison of the poverty levels based on non-

trawl ban and trawl ban per head household earning shows that during the trawl ban period some fishers are forced to enter into poverty. However, this dynamics of poverty like the movement from non-poor to poor is a temporary phenomenon and even linked with the loss of economic opportunity during the period of trawl ban specifically for the mechanised fishers.

Table 4.14. Poverty Comparison

District				Trawl Ban Poverty		Total
				Non-poor	Poor	
Kozhikode	PCI poor	Non-poor	Count	54	32	86
			% within PCI poor	62.8	37.2	100.0
		Poor	Count	2	12	14
			% within PCI poor	14.3	85.7	100.0
	Total		Count	56	44	100
			% within PCI poor	56.0	44.0	100.0
Ernakulam	PCI poor	Non-poor	Count	75	21	96
			% within PCI poor	78.1	21.9	100.0
		Poor	Count	0	4	4
			% within PCI poor	0.0	100.0	100.0
	Total		Count	75	25	100
			% within PCI poor	75.0	25.0	100.0
Kollam	PCI poor	Non-poor	Count	71	20	91
			% within PCI poor	78.0	22.0	100.0
		Poor	Count	5	4	9
			% within PCI poor	55.6	44.4	100.0
	Total		Count	76	24	100
			% within PCI poor	76.0	24.0	100.0
Total	PCI poor	Non-poor	Count	200	73	273
			% within PCI poor	73.3	26.7	100.0
		Poor	Count	7	20	27
			% within PCI poor	25.9	74.1	100.0
	Total		Count	207	93	300
			% within PCI poor	69.0	31.0	100.0

Source: Worked out from the Survey data, 2016

4.5 SHG-Cooperative Linkages and Livelihood Security

Low earning coupled with lack of alternate livelihood during trawl ban; the fishers are forced to depend on past savings or on borrowings. They mostly fall on the second option because the fishers" are prolific spenders in seasons of plenty and hence they are very poor in saving. In this circumstances the formal institutional linkages viz. SHG based cooperatives play a pivotal role for financial requirements in difficult times at affordable rate. In the globalised scenario considering the changing scenario the SHG-Cooperative movement is an inevitable part of the development dynamics of the Kerala marine fishing sector. The fishers have expressed a mixed response in considering the SHG activities as an alternate livelihood option during the trawl ban (Table 4.15). While 64 percent of the fishers in Ernakulam feel that the SHGs are the

best alternative livelihood, the percentage of fishers show less in other sample districts of Kollam and Kozhikode with 49 and 37 percentages respectively.

Table 4.15. SHGs and Cooperatives as best Livelihood Option during Trawl Ban

			Livelihood option		Total
			No	Yes	
District	Kozhikode	Count	63	37	100
		% within District	63.0	37.0	100.0
	Ernakulam	Count	36	64	100
		% within District	36.0	64.0	100.0
	Kollam	Count	51	49	100
		% within District	51.0	49.0	100.0
Total		Count	150	150	300
		% within District	50.0	50.0	100.0

Source: Worked out from the Survey data, 2016

Evaluating the membership level in SHGs as per Table 4.16, 87.3 percent of the fisher-households have memberships. Region-wise, the SHG membership is more in Ernakulam (93 percent) than in Kollam (89 percent) and Kozhikode (80 percent).

Table 4.16. SHG Membership

			Member		Total
			No	Yes	
District	Kozhikode	Count	20	80	100
		% within District	20.0	80.0	100.0
	Ernakulam	Count	7	93	100
		% within District	7.0	93.0	100.0
	Kollam	Count	11	89	100
		% within District	11.0	89.0	100.0
Total		Count	38	262	300
		% within District	12.7	87.3	100.0

Source: Worked out from the Survey data, 2016

In most of the households, the women members are part of the SHG group. In the southern and central districts, the women are mostly engaged in dry fish sale, fish vending, etc. and in the northern district, the gender proportion is almost equal. Majority if the SHG members in the northern district of Kozhikode are generally inactive. The percentages of active members are almost same in the Ernakulam and Kollam district (Table 4.17). In spite of active or inactive members, they are still regular in thrift generation, debt repayment and other financial activities.

The number of members in each group ranges between 10 and 20, but most of the SHGs have 10 members. The average numbers of members is higher in Ernakulam and Kollam. But Kozhikode SHGs have nearly same number of members on an average (Table 4.18).

Table 4.17. Kind of Member in the SHG

			Kind of member			Total
			Silent	Non-active	Active	
District	Kozhikode	Count	20	45	15	80
		% within District	25.0%	56.2%	18.8%	100.0%
	Ernakulam	Count	39	3	51	93
		% within District	41.9%	3.2%	54.8%	100.0%
	Kollam	Count	28	12	49	89
		% within District	31.5%	13.5%	55.1%	100.0%
Total		Count	87	60	115	262
		% within District	33.2%	22.9%	43.9%	100.0%

Source: Worked out from the Survey data, 2016

Table 4.18. Average Members in the SHGs

District	Mean
Kozhikode	10.37
Ernakulam	11.50
Kollam	10.38
Total	10.78

Source: Worked out from the Survey data, 2016

In the fishing sector all the SHG groups are promoted by the Matsyafed, which shows the formal-informal institutional linkages in the Kerala marine fisheries in this respect. This is a clear espousal of SHG-Cooperative linkages under the shelter of the Matsyafed, which in turn showed stories of success in the coastal belts of Kerala in ensuring the financial inclusion of the fishers. Regularity in thrift and impressive repayment rate has become the main feature of these groups. As per Table 4.19, 72.9 percent of the SHG groups have received assistance. The percentage of groups receiving financial aid is more in Ernakulam and less in Kozhikode (77.4 percent and 66.3 percent). The financial aid is mainly received through NBCFDC (National Backward Classes Finance Development Corporation) and NMDFC (National Minorities Development & finance Corporation) but the scheme is implemented through Matsyafed. Hence the Matsyafed works as a canduid of providing financial assistance for the SHG groups and the fishers perceive the Matsyafed as the main funding agency.

Table 4.19. Assistance Received to the SHGs

District	SHG Membership	Assistance Received	% of SHGs receiving Assistance	Agency	Name
Kozhikode	80	53	66.3	Government	Matsyafed
Ernakulam	93	72	77.4	Government	Matsyafed
Kollam	89	66	74.2	Government	Matsyafed
Total	262	191	72.9	Government	Matsyafed

Source: Survey data, 2016

4.6 The current status of Kerala Marine Fisheries: Fishers Perception Analysis

The perception of the fishers on 14 statements relating to issues with resource depletion, livelihood, trawl ban and other problems are worked on a five point scale viz. strongly agree, agree, neutral, disagree and strongly disagree. This is shown in Table 4.20 and Figure 4.8. The fishers have cited livelihood issues, erratic earnings and lack of alternate employment during trawl ban as major issues as majority strongly agrees or agrees to these statements. 91.7 percent have opined that there has been some decline in fish species recently and hence there are overall changes in the catch structure (86.4 percent strongly agree and agree). There is high outsider intervention in the form of large fishing vessels (58.3 percent strongly agree and 22.7 percent agree with this statement) and the exploitation from the middle-men is also an issue. The cost of fishing is also high as per the fishers (72.7 percent strongly agree). Lack of skill sets (29.7 percent strongly agree and 37.7 percent agree) would imply that there are very few chances of finding an alternate employment (27 percent and 58.3 percent showing agreement to this statement). Most of the fishers have low or no earnings during the trawl ban making their earning pattern highly fluctuating. However, 21.3 percent of the fishers disagree with the statement that there are low or no earnings during the trawl ban period. These respondents belong to the traditional and some motorized fishers whom the impact of trawl ban is less. Changes in traditional landing centers are also cited as major issues for many.

Table 4.20. Perception of Fisher folks (in percent)

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
Livelihood issues	60.0	27.3	10.7	0.0	2.0
Decline in some species	91.7	7.7	0.0	0.7	0.0
Outsider intervention	58.3	22.7	3.0	15.7	0.3
Low skill and lack of technical know-how	29.7	37.7	11.0	21.0	0.7
Changes in traditional fish landing centers	45.7	27.7	10.3	14.7	1.7
Changes in food consumption pattern	13.0	32.3	5.7	37.7	11.3
Linkage Issues	10.0	16.3	6.7	52.7	14.3
Changes in catch structure	41.7	44.7	4.0	9.3	0.3
Exploitation from middle men	52.3	24.7	6.3	14.3	2.3
Inadequacy of governmental assistance	58.3	27.3	2.0	8.7	3.7
Erratic earnings	37.3	44.3	9.3	9.0	0.0
Lack of alternate employment	27.0	58.7	7.0	7.0	0.3
High cost of fishing	72.7	18.0	1.0	8.0	0.3
No/low earnings during trawl ban	43.3	10.7	6.0	21.3	18.7

Source: Survey data, 2016

The concerns of the fishers in terms of livelihood issues, impact of intermediaries, problems with skill-set and lack of alternate avenues during trawl ban have anchored out based

on the results obtained from evaluation of the perception of fishers. They are also concerned about the inadequacy of governmental assistance during the lean season as well as during the trawl ban period for livelihood security and regular earnings.

Figure 4.8. Perception of Fisher folks
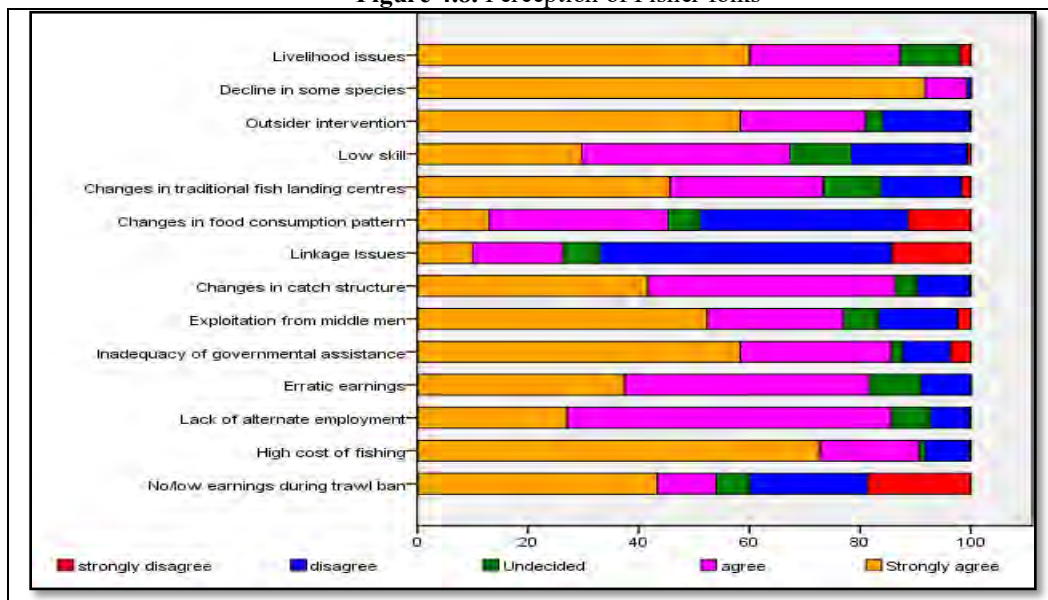
Source: Worked out from the Survey data, 2016

The catch share of fishers for major species is given in Table 4.21. Generally, the receipts from the catch after deducting all the costs and commissions are divided as the equipment-share and the crew-share. The crew-share is divided among the number of crew members in the boat.

Table 4.21. Per kg. Catch Price

Name of the Species	Price for fishermen in Rs.	Retail Price in Rs.	% Share
Seerfish	325	500	65
Tunnies	72	120	60
Pomfrets	195	300	65
Mullets	94	150	62.5
Mackerels	78	120	65
Oil sardines	58	100	58

Source: Inferences from the Field Survey, 2016

The percentage share for the fishermen for the six species is in the range of 58 to 65 percent. The rest of the fish price goes to the auctioneer, commission agent, fish vendors/retailer, etc. Even though nearly 30-35 percent of the fish sale price is for the middlemen, the per-kilogram-share is still impressive. The reason is that the fish auction being carried out by the Matsyafed through Fishermen Development Welfare Co-operative societies which ensures that the fishers have the right of first sale of the fish and in this way they get good share from the final market price. But what is problematic is fluctuating catch. A bumper catch will bring down the price of fish. In

96

such cases the per-head catch share increases, but the share in rupee terms per-kilogram-rate comes down.

4.7   Perception of fisher folks about Government Schemes

An evaluation of effectiveness of the government assistance/programmes on house construction, assistance during trawl ban, financial assistance, livelihood programmes, welfare schemes and SHG-Cooperative linkages is done again based on fishers perception. The satisfaction level of the fishers is recorded on a five point scale viz. vey highly satisfied, highly satisfied, moderate satisfaction, low satisfaction and very low satisfaction. The inference based on the three sample districts is presented in Table 4.22. The efficacy of housing programme is evaluated in Table 4.22 (a). The results show that the government assistance received is moderate or low for majority of the fisher-households. District-wise, the Kozhikode (56.4 percent) fishers are the least satisfied groups with the government assistance. Ernakulam fishers have shown moderate to high satisfaction level (43.8 percent and 18.8 percent, respectively). And the satisfaction level of majority of the Kollam fishers is at moderate (47.8 percent) and low levels (21.7 percent). Overall, only 11.3 percent and 12 percent of the households are highly or very highly satisfied with the government assistance received for the construction of their houses. In Ernakulam 39.6 percent of the households have better satisfaction level. Here it is pertinent that the satisfaction level to be evaluated not only on the quantum of government assistance but on the present situation of houses. In this respect the government funds are inadequate and hence the fishers resort to their own funds also to renovate or construct houses or to depend on loans. The satisfaction level with regard to access to formal credit is good for most of the fishers. Even though Ernakulam district outperforms the other two districts in this respect, the satisfaction level is above moderate level on an average for all the three districts. Table 4.22 (b) shows the detailed results of the same. During the trawl ban a provision to provide free ration to the fishers is prevailing. But the fishers have complained about the irregularity of this government assistance [Table 4.22 (c)]. More fishers in Ernakulam have moderate and above level of satisfaction compared to the other two districts. With regard to the welfare schemes like pensions, insurance, etc. The fishers in general have shown better satisfaction level across districts [Table 4.22 (d)]. The concerns with regard to the lack of alternate livelihood schemes during the trawl ban are well evident from Table 4.22 (e). Across the districts majority is highly dissatisfied with the livelihood alternatives provided by the government. In fact, other than free

ration scheme during this period other concrete measures are missing from the government side. The useful services provided by the Matsyafed [The Kerala State Co-operative Federation for Fisheries Development Ltd. (Matsyafed)] linked cooperatives in ensuring financial stability and access to formal credit to the fishers since its inception in 1984 have been commendable. This is well reflected in the results shown in Table 4.22 (f). District-wise, majority of the fishers in Ernakulam (66.7 percent) and Kollam (41.6 percent) has shown very high satisfaction level with the present cooperative setup and its functioning for their welfare. In the Kozhikode district, 50 percent have shown high level of satisfaction.

Table 4.22. Evaluation of Government Programmes (in percent)

Perception	District				Perception	District			
	Kozhikode	Ernakulum	Kollam	Total		Kozhikode	Ernakulum	Kollam	Total
(a) Govt. assistance for house construction					(b) Access to Formal Credit				
Very High	0.0	20.8	10.9	11.3	Very High	31.0	58.0	34.0	41.0
High	10.3	18.8	6.5	12.0	High	24.0	32.0	32.0	29.3
Moderate	23.1	43.8	47.8	39.1	Moderate	31.0	7.0	13.0	17.0
Low	56.4	16.7	21.7	30.1	Low	9.0	3.0	4.0	5.3
Very Low	10.3	0.0	13.0	7.5	Very Low	5.0	0.0	17.0	7.3
(c) Rationing provisions during monsoon trawl ban					(d) Welfare Schemes				
Very High	0.0	5.0	2.0	2.3	Very High	14.0	57.0	37.0	36.0
High	2.0	10.0	2.0	4.7	High	41.0	24.0	36.0	33.7
Moderate	1.0	19.0	0.0	6.7	Moderate	33.0	12.0	21.0	22.0
Low	25.0	34.0	51.0	36.7	Low	10.0	6.0	5.0	7.0
Very Low	72.0	32.0	45.0	49.7	Very Low	2.0	1.0	1.0	1.3
(e) Alternate Livelihood Schemes					(f) Matsyafed SHG-Cooperative Linkages				
Very High	0.0	0.0	0.0	0.0	Very High	11.3	66.7	41.6	41.2
High	7.0	19.0	12.0	12.7	High	50.0	24.7	34.8	35.9
Moderate	13.0	18.0	16.0	15.7	Moderate	21.3	5.4	11.2	12.2
Low	47.0	47.0	50.0	48.0	Low	17.5	3.2	12.4	10.7
Very Low	33.0	16.0	22.0	23.7	Very Low	0.0	0.0	0.0	0.0

Source: Worked out from the Survey data, 2016

The trawl ban impact evaluation in terms of income and livelihood security of the fisher"s shows inadequate governmental interference to mitigate the recurring hardships. The only panacea in this respect is employment generating livelihood initiatives in the coastal areas. SHGs and cooperatives definitely become a solace to the fishers to overcome the twin dangers of middle-men linked debt and to reduce unemployment and under-employment with some income earnings opportunities during difficult periods. Based on compulsion fisher-women prone more adaptive tendencies than fisher-men to the changing employment scenario through SHGs and Kudumbahasree, still their prime income earning occupation is fishery related activities. Though considerable reduction in poverty is noticed in the sample fishing villages, it becomes a grave issue in the trawl ban periods and particularly among the fishers in the mechanized hubs.

4.8   Case Studies

Five case studies from the sample fishing villages of Kollam, Ernakulam and Kozhikode are presented based on filed inferences during the sampling period so as to light up the lives and livelihood of the fishing community.

Case Study 1: SHG Activities as an alternate Livelihood option

Though, the SHG activities have started getting priority in the coastal villages, the main issue is that this activity is still related to fishing and other allied sectors. Sreedhanya SHG is a women group with 10 members in Ernakulam district. All the members in the group belong to the fishing community as their main household activity is related to fishing. The group is prompt in remittance of thrift and has received assistance from the Matsyafed. Activities of this group include processing, sales of dried fish, fish pickle, etc. The members of the group have disadvantages as their products are not directly sold in the market. They depend on middlemen to sell their product as they cannot travel to the town due to several constraints. There is also an issue with the availability of inputs during off seasons. Hence the price of their inputs often varies making it difficult for them to get a regular margin or profit. These hurdles, which are small but very crucial in the effective functioning, are hampering their activities. Even after kick starting an SHG group, the self reliance is still a distant dream for them. However, they are able to set apart some money which will help them in meeting their household expenses during lean seasons.

The above case discussed can be compared with another one in Kozhikode, viz. Humd a woman SHG belonging to the fishing community. They have similar difficulties as cited above. However, they have managed to convert these issues to their advantage. They do not prioritize the sale of dry fish/fish pickle as their main activity. Lack of fish during off seasons, they concentrate on other activities and hence the lack of raw materials has no influence on their income and livelihood. They have also got an issue with marketing of their products in the town, especially for businesses like catering and supply of bakery items. But, they are willing to resolve the issue by themselves. They are trying to eradicate middle-men from their business. They are participating in food festivals and fairs in the town and are giving wide publicity in the form of banners and in other forms about their catering business. Regarding the issue with respect to transportation facilities, they have to depend on auto or other vehicles to supply their products (bakery items and snacks) to shops in the town. The secretary of the group opined that if they could get some assistance from the Matsyafed to purchase a three wheeler to transport the materials and finished products to the town and in that case that they are also willing to learn

driving. Hence it could be inferred that whether a group is developed or not is also depending on the mindset and the involvement of these groups as well as support they receive from their family and society. As was the case with the Srredhanya SHG members, their households have an alternate income (even though lesser than the male income) during trawl ban.

In both these cases, the dependence on the private money lenders has come down drastically among the fishers. Access to formal credit is now much easier. Considering the fact that the earnings of women are fully used for the welfare of the households, no matter whatever less they earn their income is crucial in supporting the households. This is mainly because of the seasonal variations in income from fishing.

Case study 2: Livelihood issues during Trawl Ban

Sivan (pseudo name), aged 54 is a mechanized fisher in Ernakulam district. He has been engaging in fishing and related activities for more than 30 years and is well aware of the ups and downs that happens in the coastal belts. Fishing is his one and only income earning avocation and the major source of his household income is from the fishing. Earlier he worked in the non-motorised sector and the technological changes persuaded him to change his activity to mechanized fishing. Irregular earnings due to uneven catches are major problems as cited by him and number of days worked is not at all an indicator of how much they earn. Apart from the erratic earnings and risks associated with fishing, ban on trawling during the monsoon seasons is yet another issue cited by him. But the harsh reality is that together with the sticky labour, the fishers (especially the elder groups) neither have the education and the skill nor the capital to venture into non-fishing activities. Another problem is the depletion of some important and common species. He is well aware of the fact that the trawl ban is the only way to protect the depleting marine wealth. But the lack of alternate livelihood options makes subsistence very difficult during these seasons. The average household earning during the trawl ban period is virtually nil as he is the only bread earner in the household. Despite these irregularities and unattractiveness, he still wishes to engage in fishing. *"I will never give up fishing which was taught to me by my father"* he added; but he said that he never desires the future generation to take up fishing related work if they have an alternative.

Case Study 3: Case Study of a woman fish vendor

Sofi (pseudo name) is 55 year old fisherwoman of a traditional fishing family in Kollam. She has been engaging in fish vending for the past 20 years. Her husband worked in the traditional fishing sector and due to health reasons, he is unable to go for fishing for the past 6 years and she is now the only bread earner in the family. The marriages of two of their daughters

have already been done and the family had taken personal loan of Rs. 100000/-, that too from a private money lender, in addition to taking loan against property of 5 cents. There was high debt burden in the family (which fell on her) once her husband was unable to work. Earlier she used to dry and sell fish caught by her husband in the traditional craft and if it was found inadequate she used to buy fish from the auction process in the village and also dries the same and sells them to shops and to customers. Once her husband fell ill, the whole responsibility of looking after the family rested upon her. She began to concentrate more on this occupation as a means of livelihood to their family. Due to centralized landing system and large landing in some of the landing centers, it was becoming difficult to reach the locations as she has to traverse long distance to procure fish and also large quantity of landing meant a high working capital which she was not able to procure. She had to travel to the town (approximately 6 to 7 kms) to sell the product. To make matters worse, her health situation deteriorated as she suffered from Chikungunya and used to experience joint pains even after two years of being infected by the disease so sometimes she had also health constraints to travel. During financial crunch, she had no other source rather than depending on private money lender (who charged high rate of interest) for purchasing fish or in the case of contingency expenses for household purposes. She had also problem with supply of fish which is highly seasonal and fluctuating and during off seasons it was difficult to procure fish or even to dry and process them (during rainy seasons). The situation meant that she had no source of alternate livelihood during the off seasons. The Matsyafed has come in as a savior to her household. Procuring credit is not at all a problem for her as she gets interest-free loan and she needs not have to be at the mercy of private money lenders. Presently she has no anxiety about livelihood security of their family as she feels that the current system will be a support to her and will help her to earn a stable income for a long period of time. She is slowly repaying the debt and hailed the community motivator of the Matsyafed for supporting her. According to her, the constraint she faces in undertaking the activity is that of traveling nearly 7 km twice a day. The stress and strain in dealing with the activity and also traveling expenses (bus fare) prompt her to restrict her activity within certain limit. The only cause of concern to her is the deteriorating health condition of her husband and herself. "I am confident that as long as I am healthy I can do fish vending and support my family" she said.

Case Study 4: Allied Worker

Dasan (pseudo name), 64 years was a fisherman in the Kollam district. Earlier he was engaged in the non-motorised sector and with the advent of the motorization; he shifted to motorized fishing units. He has been in the fishing occupation for the past 40-44 years. Due to

the age related health problems, he is not undertaking fishing activity at present and is engaged in the net making/repairing activity in the village itself. His son has a share in a motorized craft. He also works in his son"s fishing unit for repairing net. In some cases, the members of the crew engage themselves in repairing their nets and craft during lean season and will not employ outside labour and hence during that time he has no other employment. "Now-a-days, because of too many crafts engaged in fishing operations, nets get damaged easily. There are instances in which nets get damaged completely and beyond repair and buying a new net is costly. Under such compelling circumstance, members of the crew/retired fishermen and also share holders themselves engage in repairing nets.

Case Study 5: Resource Depletion Issues

Manoj (pseudo name), 39 years is working in the mechanized craft in Puthiyappa fishing village in Kozhikode district of northern part of Kerala. He has been working with mechanized crew as a wage labourer for nearly 20 years. Fishing comes to him as inherited job and hence is a family occupation for him. He has passed SSLC and is f the opinion that the fishing and related activities are the only income earning option available to him in the village. Lack of skill deters him from going for other types of employment outside his village. He opined that the perennial resource depletion is the major issue hampering the livelihood security of the fishers. This is due to the unscientific fishing methods and also large scale operation of fishing vessels from other states. According to him, the landings of some common fish species have come down drastically. The price of fish has shot up but most of its advantage goes to the intermediaries. Presently the fishers are facing serious livelihood threat. He urged the need to impose strict regulations to ensure livelihood security and resource sustainability for the sake of the fishers, failing which the future of fishing sector will in doldrums. He added that he likes his children to go for other employment sectors than fishing. "We, the fishers want to protect the sea and its resources for our future generations failing which the returns in the future does not look promising. But what we need is the help from the authorities towards resource sustainability, together with the livelihood protection schemes during lean seasons" he added. But he is also of the opinion that the governmental set up both at the centre and the state are inimical to the real fishers. This is the reason why there is always a policy shift favouring the industrial fishing groups.

Chapter 5
Conclusions and Policy Options

5.1   Conclusions

5.1.1   Dynamics of Fisheries Development

A clever multilateral project infusion in the traditional fishing sector of Kerala with the idea of increasing output for enhancing livelihood made undesired endings with high marginalization of the real fishers. However, the fishing sector was not capable of absorbing the rampant ramification associated with technological changes of trawling, purse-seining, mechanization and hence motorization phase witnessed abnormal resource depletion.   The changing fishery paradoxes with high control of the system by the capitalist groups (non-fishers) with unprecedented gains have resulted in peripheral gains to the real fishers. The struggle for livelihood that ignited in the beginning of the 80s with the proliferation of the fishers union generated the scenario of banning of trawling.

Another paradox in the fishing sector in the stagnation phase is the increased fishing assets with decreased earnings- a real espousal of over capitalization. In this phase of the fisheries sector, though the stagnation is all pervasive, it is more visible with respect to economic species. In the export oriented phase also the real gainers were business non-fishing community, but the fishers who are at the lower end of the supply chain turned to be losers. Motorization phases (in the pre-globalised period), though helps the real fishers to fight against the capitalist groups; it also leads to severe stagnation of the entire fishery sector of Kerala.   This has also witnessed the birth of a new paradox, traditional fishers form as a major threat group to the mechanized group. This has been carried out with the use of large scale encircling net and other more powerful gears than the mechanized trawl net.

Subsequent fishery regulation and trawling regulation have helped the fishery recuperation and subsequently alarming stagnation with larger livelihood issues. This is well explained with two specific temporal dynamics. First trawl ban period (first decade of globalization) shows moderate dynamics with impressive average of 5572976 tones. The second trawl ban (second decade of globalization) shows also an impressive dynamics with a high average output of 600000 tonnes. In comparison it shows that the first phase of fishery

globalization to the second phase, the major dynamics happened in the output contributions of the three visible sectors in the fishing sector. Motorised sector (60.4 percent) has doubled the share of the output of the mechanized (30.2 percent) and more than six times share of the basic traditional sector (9.4 percent).

5.1.2 Sustainability aspects

Sustainability aspects based on empirical estimates of resource sustainability shows that in the pre-globalised period (in three phases) showed an increase (from 0.45 to 0.563 percent) and then to a decrease (0.498 percent) from the historical limits of the catch. But the estimates for the three phases of the post-liberalized ban period shows constancy of the historical percentage changes (from 0.850 to 0.858 to 0.855 percent). Another notable analysis connected to resource depletion in the pre-ban (pre-globalised) to post-ban (post-globalised) shows that some species like sardine and mackerel have moderate depletion in the post-ban. It also shows better status of depletion stages in the post-ban period in comparison to the pre-ban period.

5.1.3 Family status and socio-economic

Socio-economic and family status of the fishing community shows substantial improvement in post-globalised era in comparison to the pre-globalised period. Living condition of the fishers in the sample area (houses, latrine, drinking water facilities, electrification etc) shows considerable improvement by considering the secondary data source. But still these areas need further improvement to catch up the average basic facilities of Kerala. District-wise evaluation of the Standard of Living Index (SLI) shows wide variation, as Kozhikode sample households (60 percent) are in the low SLI, where as Kollam and Ernakulam fishers percentages respectively are 34 and 16. Out of 300 sample households, irrespective of the district‟s 39 are only in the high SLI group. But analysis gives impressive pattern with 110 in low SLI, 151 in medium SLI and 39 in high SLI. Asset pattern of the fishers in the sample area explains improvement in non-fishing assets like TV, mobile phone, cooking gas etc. But in the case of fishing assets like mechanized boats and large motorised boats are very less. Some of the sample households‟ fishers own this, but most are in the form of collective ownership.

Primary data relating to religious category of the fishing community show very high spatial differences. But majority of the fishers (42.7 percent) is Christians. Gender pattern shows no significant regional differences and also irrespective of male or female fishers most of them

are in the favorable population window of 15-59 age groups. The present status of education of the fishers shows good improvement with significant spatial variations. The level of attainment of higher education among the fishers irrespective of regions is still bleak.

5.1.4 Income and livelihood

The occupational structure of the fisheries shows manifold changes with the advent of globalization in the fishing sector. The activity status not only shows regional differences based on fishers households but it illustrates that employed category forms the major share-groups among the household members. The activity status also pinpoints high level of gender bias as 63.8 percent are males in comparison to 11.8 percent females. Dichotomizing the type of activity into fishing and non-fishing, household data show that still fishers employment are mostly connected to the fishing sector.

Sectoral inferences of employment show that motorised sector gives 45.3 percent of the fishing sector employment. Employment pattern during the trawl ban period gives the picture that mechanized fishers are hit the most as 64.6 percent do not have any job. Trawl ban effect to the total fishers in the sample area shows that 25.8 percent have no alternative means of employment.

Livelihood and income analysis also highlights considerable spatial differences as Ernakulam is coming in the top with 6991.98 average individual incomes and Kozhikode with the lowest income of 6357.30. Gender wise high difference is noticed with respect to individual income in all the three sample districts with some variations. In the case of Ernakulam the male-female income is 6465.53 for males and 3500 for females. Average individual income also varies with respect to activity. The earning of the fishing activity is less than the non-fishing activity in all the three sample districts. Based on employment type, high level of variation in the average individual income is noticed. The traditional fishers earn less than the motorised and the motorised fishers earning is less than the mechanized.

5.1.5 Poverty and Inequality

Poverty analysis shows that the poverty level among the fishers is low, but the erratic earnings make them more vulnerable. Empirical estimates of poverty and inequality based on Gini coefficient in the three surveyed districts show that the Kollam fishers" exhibits high

inequality (0.326) compared to other two districts fishers. Income poverty of the fishers is higher than the expenditure poverty in the sample villages. Inter-district comparison of poverty explains that Kollam has poorer indicators than Ernakulam in terms of relative incidence and severity.

5.1.6   Financial habits

The fishers have poor financial habits. Income-expenditure pattern of the fishers irrespective of the sample districts shows that expenditure is more than income. This shows that they are always in debt. Analysis based on saving pattern of the fishers shows that 69 percent of the households have regular saving habits with some variations among the sample districts. Savings of the fishers are mostly connected to co-operative societies. Difficulty in assessing formal credit becomes the major issue for their high indebtedness. Though, Kudumbashree penetration is less in the coastal surveyed villages, Ernakulam shows some prominence.

5.1.7   Perception

Fishers perception in various inter connected activities is too weak to link for a good future. Fishers perception for a permanent shift from fishing to non-fishing even with livelihood issues in the fishing village gives the fact that about 86 percent of the fishers are unwilling to do so. Skill issues and employment opportunities hinder the fishers to opt for a shifting. But a generational difference as per fishers" perception is obvious as younger fishers are seemed to have such kind of preferences. Fishers generally perceive a positive correlation between trawl ban and resource sustainability. In terms of food security and nutritional security, 56 percent of the fishers feel that this is true temporarily. This change in food consumption pattern also leads to several health ailments.

5.1.8   Trawl ban impact

Analyzing the post 1950s technological change in the resource based sectors of Kerala; the fishing sector is peculiar with sporadic changes of technology useful to a certain faction and unwanted to most of the real fishers. Trawl ban period employment issue is seemed to be more among male-fishers than female-fishers. Empirical estimates of temporal analysis of employment changes during trawl ban (5 years back, 10 years back and 20 years back) period shows marginal positive changes recently. Income earning during trawl ban also shows wide differences in a sub-sectoral comparison as mechanized fishers have the lowest mean value. Poverty impact based on

empirical estimates during trawl ban shows entry of more fishers in poverty and after the trawl ban period similar exit also from property is clear. As the fishers face financial difficulty during the trawl ban period the SHG linked cooperatives play crucial role for financial inclusion of the fishers.

5.2   Policy Options

The study comes to some important policy options for immediate interference in the fishing sector of Kerala.

It is necessary to control the number of crafts in each sub-sector based on fishers" involvement by working out the number of active fishers. This will help to control over-capitalization to a certain extent. Motorised-mechanized crafts difference has come down. High horse power engine connected motorised vessels are in fact efficient in fishing operations with high area coverage. It is necessary to control fishing gears like mini-trawls and other detrimental gears as it is widely used by the motorised fishers. This is paradoxical. The protectors have turned into destructors. This is to be curtailed through necessary legislation and monitoring. Hence new craft-gear combination limits are to be worked out with the resource availability and target specie availability. Therefore area specific resource potential specie-wise to be evaluated and the number of vessels required for fishing the existing species.

Fish production sans local peoples consumption for export is not sustainable as it focuses on demersal species resources based on trawling both by the mechanized and high horse power connected motorised units. Hence the focus of fishing is to be changed with policy changes. Mechanized-motorised trawling produces more trash fish. In the beginning it did not fetch any market. Now there is a niche market as input in the fish meal plants and hence there is an agency network for getting more input for the fish meal production. This can easily be controlled with mesh-size regulation. Mesh-size has been regulated legally, but the fishers are not adhering to it owing to high demand for all sizes of fish both market and industrial demand. The government has to form an inspection agency for periodic checks to see that the rule is strictly implemented for ensuring resource sustainability.

As economics is playing chaos in the fish extracting sector based on opportunity cost of investment, it is necessary on the part of the government to popularize aquaculture production for safeguarding food and nutritional security for the local people. Fishers" income from fishing

is purely a price index spiral, but the government interference through Matsyafed helped high inroads in the sector with high per-rupee-share in the first sale of fish. This is mostly urban-centric. Hence more involvement is required in all the 222 coastal fishing villages.

As fishing sector is the only resource based sector in Kerala with endemic encounters for livelihood and in this, one is gained with the loss of the other, a real game rhetoric play. In this respect it is essential on the part of the government to protect the losers through appropriate livelihood schemes suiting to the socio-cultural milieu of the fishing community.

Post-globalised fishing sector shows high dynamism but different epochs have different story of the tragedy of the commons as in the recent deep sea and joint venture policies to harness the untapped resources. But the fishers perception is diametrically opposite as overfishing anywhere in the Indian sea will have high impacts for the resource availability for the Commons. Hence it is necessary to frame fishing policies by looking into the pathetic face of the fishers and depleted nature of the fish resources.

Trawl ban era needs special care to protect the fishers from unemployment and temporary entry to poverty severity and threshold. Any management measure globally in the fishing sector will become successful if the fishers" unemployment and livelihood is safeguarded through welfare and other compensation measures by the government. An easy policy measure to effectively implement is MGNREGA in the mechanized fishing hubs of Kerala during the trawl ban period and ensure the participation of a household member form the fishers. 60 days participation of a family will help to obtain an income of about Rs 7000 per month. The government can entrust this either to the coastal based panchayaths or to the Matsyafed through fisheries department. To release the surplus labour from fishing, it is indispensable to develop beach tourism and sport tourism in several coastal villages similar to Kovalam, Varkala and Bekel and entrust this to the active local fishing communities with proper infrastructure development by the government. Recent deed of the fishers to take the catch without taking fish from the net to the close-knit driveways (as in Ambalapuzha to Harippad) for sale attracts high demand. This helps the local fishers to obtain 100 percent of the market value of their produce, particularly low value species like sardine and mackerel. High demand comes as the consumers perceive that it has not been contaminated with ammonia or formalin mixed ice. Matsyafed can take steps to popularize this by widening this to more species as well to all coastal highways.

It is well known that the fishers are the best managers of the fishery as it is their basic sustenance; hence any fishery policy regarding craft, gear or closed seasons need to address their concerns and value their knowledge in the fishing system and the resource pattern. In this way most of the ailments of the fishery can be lessened.

5.3   Action plan

The study has helped to suggest the policy makers to develop necessary action plan based on its urgency. For this purpose it is proposed in three tiers encompassing short-term, medium-term and long-term.

5.3.1   Short-term

a) Urgent step is warranted to control over capitalization of fishing assets (fishing crafts and gears).

b) Legal measures and strict control of the Horse Power of the motorized vessels, as the number of the motorised vessels are increasing more than the required as per the resource availability.

c) It is required to control of mini-trawl and the detrimental gears as it endangers fishery sustainability.

d) Fishers are to be assisted properly during the trawl ban period in the form of daily unemployment allowances or assistance through MGNREGS for sustenance and livelihood.

5.3.2   Medium-term

a) New craft-gear combinations that are suited regionally for fishing to be worked out.

b) Based on the resource pattern it is required to control the number of fishmeal plants as it affects the fish resources sustainability.

c) To overcome sustainability issues from the fish harvesting sector (to ensure the availability of quality fish for local consumption), it is required to popularize aquaculture, which will definitely safeguard the nutritional security of the people.

d) It needs to ensure alternate livelihood issues through skill development and training to release the surplus labour from fishing to non-fishing activities. This could be

implemented by linking 10 close-knit fishing villages in the coast with a training centre for skill development for alternative livelihood.

e) Periodic assessment of resources and its carrying capacity, employment and income level of the fishers are to be made.

f) To ensure that the central and state assistances to the fishers are reached in the hands of the real fishers.

g) Region-specific and time-bound schemes are required in the areas of health, education, infrastructure and livelihood for improving their socio economics and family status so as to change their outliers" status to the central tendency level in the Kerala society.

5.3.3 Long-term

a) Need policy shifts from fishing for export to fishing for local consumption. This will *inter alia* protect the fishery from the trawling impacts.

b) Need to develop a clear data bank for research and development of the fishing sector, which is totally lacking at present. There are lots of differences in the statistics available from the state and central agencies which needs to be addressed properly.

References:

Allison, E.H., Delaporte, A. and Hellebrandt de Silva, D. (2013), "Integrating fisheries management and aquaculture with food security and livelihoods for poor", Report submitted to Rockefeller Foundation, School of International Development, University of East Anglia, Norwich, UK. 124 p.

Balan (1998), "Marine Fish Production in Kerala", published in Kadalekum Kanivukal (Bounties of the Sea), Central Marine Fisheries Research Institute, Cochin.

Central Marine Fisheries Research Institute (CMFRI) (1980), „Marine Fisheries Census 1980", Government of India, Ministry of Agriculture, Department of Animal Husbandry, Dairying & Fisheries, Krishi Bhavan, New Delhi and Central Marine Fisheries Research Institute, Cochin (Indian Council of Agricultural Research, New Delhi).

Central Marine Fisheries Research Institute (CMFRI) (2005), „Marine Fisheries Census 2005, Government of India, Ministry of Agriculture, Department of Animal Husbandry, Dairying & Fisheries, Krishi Bhavan, New Delhi and Central Marine Fisheries Research Institute, Cochin (Indian Council of Agricultural Research, New Delhi).

Central Marine Fisheries Research Institute (CMFRI) (2010), „Marine Fisheries Census 2010, Government of India, Ministry of Agriculture, Department of Animal Husbandry, Dairying & Fisheries, Krishi Bhavan, New Delhi and Central Marine Fisheries Research Institute, Cochin (Indian Council of Agricultural Research, New Delhi).

Charles Anthony, T (2001), "Sustainable Fishery Systems, Fish and Aquatic Resources", Series 5, Blackwell Science, Landon, pp384.

CMFRI (2009) Annual Report 2009, Central Marine Fisheries Research Institute, Kochi.

Damgaard, C., (2003), "Gini coefficient", Math World–A Wolfram Web Resource, created by Eric W. Weisstein. [online]. Available: http://mathworld.wolfram.com/GiniCoefficient.html, accessed on 25.03.2016.

Department of Fisheries, (1990), Socio Techno Economic Survey of Fisher folk in Kerala 1984, Department of Fisheries, Government of Kerala, Thiruvananthapuram.

Department of Fisheries, (2005), Socio Techno Economic Survey of Fisher folk in Kerala 2004, Department of Fisheries, Government of Kerala, Thiruvananthapuram.

Directorate of Fisheries (1969), "Master Plan for Fisheries Development", Kerala State Fisheries Directorate, Trivandrum.

Directorate of Fisheries (2015) www.fisheries.kerala.gov.in, accessed on 12.01.2016.

FAO (2014) "The state of world fisheries and aquaculture: Opportunities and challenges", Food and Agricultural Organization (FAO), United Nations, Rome 2014.

Firth, R. (1947), "Malay fishermen: their peasant economy", The Journal of Asian Studies, Vol.6 (03), pp 309-311. http://dx.doi.org/10.2307/2049351.

Foster, J., J. Greer, and E. Thorbecke (1984), "A Class of Decomposable Poverty Measures", Econometrica, 52, 761-76.

Galtung, J. (1984), "The Indo-Norwegian Project in Kerala: A Development Project Revisited". In international Asian forum, Vol. 15(3), pp 253-274.

Gerhardsen, G.M (1958), "The Indo-Norwegian Project", in Fisheries of the West Coast of India (edited by Dr. S. Jones), Central Marine Fisheries Research Station, Mandapam Camp, S. India.

Government of Kerala (2015), Fisheries Statistics at a Glance 2015, Department of Fisheries, Government of Kerala, Thiruvananthapuram.

HLPE, (2014), "Sustainable fisheries and aquaculture for food security and nutrition". A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome 2014.

Ibrahim, P. (1992), „Mode of production on the eve of mechanization: In fisheries development in India". Classical publishing company, New Delhi.

Kent, G. (1985), "Food Trade: The Poor Feed the Rich", Food and Nutrition Bulletin, Vol. 4, No. 4, pp. 25-33.http://www.unu.edu/unupress/food/8F044e/8F044E05.htm.

Kent, G. (1997), "Fisheries, food security and the poor" Food Policy, Vol-22(5): pp 393–404. ELSEVIER Science Ltd.

Kerala Marine Fisheries Statistics (2010), Directorate of fisheries, Government of Kerala, Thiruvananthapuram.

Klausen, A. M (1964), *"Technical Assistance and Social Conflict: A Case Study from the Indo-Norwegian Fishing Project in Kerala, South India"*, Journal of Peace Research, Vol. 1, No. 1 (1964), pp. 5-18

Kocherry, T (2000), "The Impact of Mechanization on the Coastal Fisheries", Indian Fisheries over the past 50 Years.

Korakandy, R. (1987), "Technological Change and the Development of the Primary Fishing Industry of Kerala-A Study of Limited Growth", (Doctoral dissertation, Cochin University of Science and Technology), Cochin.

KSCADC (2016), Kerala State Coastal Area Development Corporation Limited (KSCADC) http://keralacoast.org/, accessed on 15.01.2016.

KSPB (1960-2015), Economic Review (Various years from 1960 to 2014), Kerala State Planning Board, Thiruvananthapuram.

KSPB (2014), "Economic Review 2014". Kerala State Planning Board, Trivandrum.

Kumar Suresh, P. (1999), "Technology and Labour Process: A case study on fishing industry in Kerala‖, (Doctoral dissertation, Cochin University of Science and Technology) India. Retrieved from http://hdl.handle.net/10603/1508.

Kurien J (2005), "Sustainable Development and Fisheries Subsidies: Some Preliminary Thoughts", International Seminar- Untangling Fisheries and Trade Towards priorities for Action, Geneva, Switzerland, International Centre for Trade and Sustainable Development.

Kurien, J (1985), "Technical Assistance Projects and Socio-Economic Change: Norwegian Intervention in Kerala's Fisheries Development", Economic and Political Weekly, Vol. 20, No. 25/26 (Jun, 1985), pp. A70-A88.

Kurien, J. (1988), "Studies on the role of fishermen's organizations in fisheries management. The role of fishermen's organizations in fisheries management of developing countries with particular reference to the Indo Pacific region". FAO, Technical Paper No., (300): pp 29–48 www.fao.org/docrep /003/ T0049E/ T0049E00.html.

Kurien, J. (1995) http://www.fao.org/docrep/004/y1290e/y1290e0g.htm

Kurien, J. (2000), "Community property rights: Re-establishing them for a secure future for small-scale fisheries in Use of property rights in fisheries management", Proceedings of the Fish Rights Conference, Fremantle, Western Australia, 11-19th November 1999. Mini-course lectures and core conference presentations. FAO Fisheries Technical Paper No. 404/1; pp. 288-294. http://www.fao.org/documents/.

Kurien, J., & Mathew, S. (1982), "Technological Change in Fishing its Impact on Fishermen", Centre for Development Studies (CDS), Thiruvananthapuram.

Marine fishery census (2010), Central Marine Fisheries Research Institute (CMFRI), Marine Fisheries Census, Part II. Government of India, Ministry of Agriculture, Department of Animal Husbandry, Dairying and fisheries, Krishi Bhavan, New Delhi.

Mathur, P. R. G. (1977). ‚The Mappila fisher folk of Kerala: a study in inter-relationship between habitat, technology, economy, society, and culture‟. Kerala Historical Society, Trivandrum.

Meenakumari Commission Report (2015),"Report of the Expert Committee submitted to the Government of Kerala", Department of Fisheries, Thiruvananthapuram.

Menon, N G and Pillai, N G K (1996, "The Destruction of Young Fish and its impact on Inshore Fisheries", Marine Biodiversity Conservation and Management, ICAR, CMFRI, Kochi.

Nair, Balakrishnan N.(2000), Report of the Expert Committee for Fisheries Management Studies (12th July 2000), Directorate of Fisheries, Thiruvananthapuram.

Panayotou, T. (1982), "Management concepts and small-scale fisheries: Economic and Social Aspects", FA0 Fisheries Technical Paper 228, Rome.

Pillai, N. G. K., Vivekanandan, E., Ganga, U., & Ramachandran, C. (2009), "Marine Fisheries Policy Brief-1", CMFRI Special Publication, 100, 1-24.

Rajasenan, D (2006), "The Kerala Model of Fisheries Development and Indigenous Fishers Response: Regulation, Exigency and Sustainability", Indian Journal of Millennium Development Studies, Vol. 1, No, 2, pp 187-200

Rajasenan, D (2015) "Blue Revolution versus Fishers Livelihood: Review of the Deep Sea Fishing Policy Embracing Multinationals in Indian Waters", Journal of Economics and Sustainable Development, Vol. 6 (5).

Rajasenan, D (2015) "Livelihood Imperatives of the Fishing Communities in a Dynamic Environment of Climate Change", Science Communicator, Directorate of Public Relations and Publications, CUSAT

Rajasenan, D. and Parvathy, P. (2012) "Marine Product Exports of Kerala in the ASEAN India Free Trade Area: Possibilities and Challenges", Journal of Economics and Sustainable Development, Vol-3, No 7, 2012.

Rajasenan, D. and Paul, P. Binu (2012), "Unsustainable Exploitation and the Importance of Fisheries Management-An Analysis of Kerala Marine Fishery", Asian African Journal of Economics and Econometrics, Vol-12, No 2.

Sathiadhas, R (2009), "Inter-sectoral Disparity and Marginalization in Marine Fisheries in India, Asian Fisheries Science, Vol-22 (2). Pp 773-786.

Saxena, B.S. (1970), "Use of Economic Perimeters in the Rationale Exploitation of Deep-Sea Fisheries with Particular Reference to Shrimp Fishery of Kerala Coast", Indian Sea Foods, Vol. III, No.I.

Thomas, J. (1989), "Socio-Economic Factors Influencing Educational Standards in a Marginalised Community: A case Study on the Marine Fisher folk of Kerala", Mphil Thesis CDS, Trivandrum.

World Bank. (2013), "Fish to 2030, prospects for fisheries and aquaculture", World Bank Report Np.88177-GLB, Washington DC. 102 p.

Appendix

Appendix 2.1. Marine Fish Production in Kerala 1950-2014

Year	Quantity (in tonnes)	Year	Quantity (in tonnes)	Year	Quantity (in tonnes)	Year	Quantity (in tonnes)
1950	202047	1966	346744	1982	325367	1998	542696
1951	191032	1967	364829	1983	385817	1999	507287
1952	129345	1968	345301	1984	394372	2000	604113
1953	111999	1969	294787	1985	325536	2001	593783
1954	117034	1970	392880	1986	382791	2002	603286
1955	105457	1971	445347	1987	303286	2003	608525
1956	152213	1972	295618	1988	468808	2004	601863
1957	309926	1973	448269	1989	647526	2005	536215
1958	294655	1974	420257	1990	662890	2006	591902
1959	191375	1975	420836	1991	564161	2007	619255
1960	344605	1976	331047	1992	560742	2008	670095
1961	267494	1977	345037	1993	574739	2009	517720
1962	191421	1978	333739	1994	540813	2010-11*	560398
1963	202380	1979	330509	1995	531646	2011-12*	553177
1964	317974	1980	279543	1996	572005	2012-13*	530638
1965	339173	1981	274395	1997	574774	2013-14#	522000

Source: CMFRI, 2009; * KSPB, 2014; # Government of Kerala, 2015

Appendix 2.2. Share of Traditional and Mechanized Sector in Catch

Year	% Share of Traditional Sector	% Share of Mechanized Sector
1971	89.4	10.6
1972	86.9	13.1
1973	79.1	20.9
1974	75.9	24.1
1975	57.2	42.8
1976	82.3	17.7
1977	68.9	31.1
1978	68.6	31.4
1979	71.3	28.7
1980	51.7	48.3

Source: Korakandy, 1987

Appendix 2.3. Percentage share in Total Catch 1974-84

	Oil sardine	Mackeral	Prawns	Others
Kozhikode	25.0	23.9	6.5	7.6
Malappuram	11.2	9.6	3.0	5.2
Thrissur	12.7	9.9	2.3	4.0
Ernakulam	18.3	32.1	15.1	19.5
Alappuzha	25.2	13.8	9.0	16.7
Kollam	7.6	10.7	64.2	47.0
Total	100.0	100.0	100.0	100.0

Source: Worked out from Korakandy, 1987

Appendix 2.4 Sector-wise Share in Catch

Period	Traditional	Motorized	Mechanized	Total
1956-59	100.0	0.0	0.0	100.0
1960-66	96.0	0.0	4.0	100.0
1967-75	84.0	0.0	16.0	100.0
1976-80	69.0	0.0	31.0	100.0
1981-88	31.1	38.4	30.5	100.0
1989-2013	9.4	60.4	30.2	100.0

Source: Worked out from CMFRI data (various years)

Appendix 3.1. Assets

District	TV	Cable	Radio	DVD	Land Phone	Mobile	Computer	Refrigerator	Mixie	Gas connection	Sewing Machine	Others
Kozhikode	82.00	73.00	2.00	29.00	5.00	74.00	3.00	49.00	59.00	74.00	15.00	1.00
Ernakulam	90.00	87.00	8.00	57.00	4.00	93.00	7.00	51.00	75.00	86.00	20.00	9.00
Kollam	89.00	79.00	2.00	35.00	4.00	65.00	5.00	53.00	67.00	79.00	15.00	5.00
Total	261.00	239.00	12.00	121.00	13.00	232.00	15.00	153.00	201.00	239.00	50.00	15.00

Source: Survey data, 2016

Appendix 3.2. Transportation

District	Bicycle	Motor Cycle	Auto Rickshaw	Car/Jeep	Pickup Van	Others
Kozhikode	24.00	29.00	1.00	0.00	0.00	0.00
Ernakulam	11.00	37.00	1.00	2.00	0.00	0.00
Kollam	17.00	26.00	2.00	1.00	0.00	0.00
Total	52.00	92.00	4.00	3.00	0.00	0.00

Source: Survey data, 2016

Appendix 3.3. Fishing Assets

District	Mechanised Boat	Motorised Boat	Small Boat	Fishing Net	Fishing Gears	Others
Kozhikode	6.00	12.00	15.00	50.00	23.00	0.00
Ernakulam	8.00	10.00	21.00	51.00	32.00	2.00
Kollam	12.00	14.00	20.00	54.00	29.00	2.00
Total	26.00	36.00	56.00	155.00	84.00	4.00

Source: Survey data, 2016

Appendix 3.4. Ration Card

			Ration Card		Total
			APL	BPL	
District	Kozhikode	Count	38	62	100
		% within District	38.0	62.0	100.0
	Ernakulam	Count	45	55	100
		% within District	45.0	55.0	100.0
	Kollam	Count	43	57	100
		% within District	43.0	57.0	100.0
Total		Count	126	174	300
		% within District	42.0	58.0	100.0

Source: Survey data, 2016

115

Appendix 3.5. Insurance

			Insurance		Total
			No	Yes	
District	Kozhikode	Count	52	48	100
		% within District	52.0	48.0	100.0
	Ernakulam	Count	33	67	100
		% within District	33.0	67.0	100.0
	Kollam	Count	59	41	100
		% within District	59.0	41.0	100.0
Total		Count	144	156	300
		% within District	48.0	52.0	100.0

Source: Survey data, 2016

Appendix 3.6. Health Card

			Health Card		Total
			No	Yes	
District	Kozhikode	Count	67	33	100
		% within District	67.0	33.0	100.0
	Ernakulam	Count	12	88	100
		% within District	12.0	88.0	100.0
	Kollam	Count	48	52	100
		% within District	48.0	52.0	100.0
Total		Count	127	173	300
		% within District	42.3	57.7	100.0

Source: Survey data, 2016

Appendix 3.7. Savings

District	save		Total
	Yes	No	
Kozhikode	60	40	100
Ernakulam	76	24	100
Kollam	68	32	100
Total	68	32	100

Source: Survey data, 2016

Appendix 3.8. Saving Pattern

			Saving Pattern		Total
			Regular	Irregular	
District	Kozhikode	Count	19	41	60
		% within District	31.7	68.3	100.0
	Ernakulam	Count	37	39	76
		% within District	48.7	51.3	100.0
	Kollam	Count	25	43	68
		% within District	36.8	63.2	100.0
Total		Count	81	123	204
		% within District	39.7	60.3	100.0

Source: Survey data, 2016

Appendix 3.9. Purpose of Savings*

District	Daily Expenses	Education	Marriage/other functions	Treatment	House Construction/maintenance
Kozhikode	50	3	29	7	12
Ernakulam	41	5	25	8	22
Kollam	48	4	23	7	18
Total	46	4	25	7	18

Source: Survey data, 2016; * Multiple responses. Percentages may add up to more than 100

Appendix 3.10. Saving Instrument*

	Bank	Post Office	Chit funds	At home	Gold	Insurance	Cooperative/ SHGs
Kozhikode	15	20	17	82	37	7	82
Ernakulam	24	29	53	46	59	16	97
Kollam	22	26	41	56	44	13	91
Total	21	25	38	60	48	12	91

Source: Survey data, 2016* Multiple responses. Percentages may add up to more than 100

Appendix 3.11. Source of Debt

District	Bank	Lender	Kudumbashree	SHG/Cooperatives	Others
Kozhikode	32	12	2	58	15
Ernakulam	52	3	9	76	8
Kollam	38	9	6	65	11
Total	41	8	6	66	11

Source: Survey data, 2016

Appendix 3.12. Poverty

District	Poor No	Poor Yes	Total
Expenditure Poor			
Kozhikode MPCE Poor	91	9	100
Ernakulam MPCE Poor	99	1	100
Kollam MPCE Poor	97	3	100
Total MPCE Poor	96	4	100
Income Poor			
Kozhikode PCI Poor	86	14	100
Ernakulam PCI Poor	96	4	100
Kollam PCI Poor	91	9	100
Total PCI Poor	91	9	100

Source: Survey data, 2016

Appendix 3.13

The general form of FGT index:

When   α = 0 ----------- P (α = 0) – Head Count Index (HCI)

$$P(\alpha) = \frac{1}{N} \sum_{i=1}^{q} \left[1 - \frac{X_i}{\pi} \right]^{\alpha}$$

α = 1 ----------- P (α = 1) – Poverty Gap Index (PGI)

α = 2 ----------- P (α = 2) – Poverty Severity Index (SPGI)

The higher the value of α, the greater is the sensitivity of the measure to the well-being of the worst off.

Household Schedule No:	

Impact of Trawl Ban on Employment and Food Security of the Fisher folks in Kerala: an Analysis in the Context of Globalization

QUESTIONNAIRE

Location

❑ Kozhikode

❑ Ernakulam

❑ Kollam

District……………………………..Taluk …………….........................
Village……………………...
Panchayat…………………………..Ward No……………………………
Name of the Respondent……………..
Age of Respondent ……………………………………………………….
Religion…………………………………..Caste…………………………
House Name/No...

Details of Visits to the Household

Name of Investigator…………………………………Signature…………………..
Date of Interview…………………………………………Time………………………..

International Centre for Economic Policy and Analysis (ICEPA)
Cochin University of Science and Technology, Cochin-22, Kerala, India

1. Profile of household members

Member ID	Name (Head of the HH first)	Sex (Male-1 Female-2)	Age	Relation (Code-1)	Marital Status (Code-2)	Educational Qualification (Code-3)	Activity Status (Code-4)	Activity Type If employed (Fishing-1; NonFishing-2)
M1								
M2								
M3								
M4								
M5								
M6								
M7								
M8								
M9								
M10								

Code-1
Head of the HH-1
Father/ Mother-2
Husband/Wife-3
Unmarried children-4
Married children-5
Son in law/Daughter in law-6
Grandchild-7
Father in law/Mother in law-8
Brother/sister-9
Others (specify)..................10

Code-2
Unmarried-1
Married-2
Widow /
Widower-3
Divorced-4
Separated-5

Code-3
Illiterate-1
Literate without formal schooling-2
Primary-3
Upper Primary-4
Up to SSLC-5
SSLC pass-6
Pre-degree/Plus II-7
Diploma/Certificate course-8
Graduation -9
Post graduation (PG) -10
Professional course-11

Code-4
Employed-1
Unemployed-2
Student-3
Doing household chores-4
Unable to work-5
Unwilling to work-6
Others 7

2. Monthly Expenditure (Average): …………………………………

3. Activity/livelihood details of the members:

Member ID (Earning member only)	Employment (Main-E Subsidiary-S) (Code - 5)		Employment During Trawl Ban (Code-6)	Type of E1and S1 Employment (Code-7)		Average No. of Days worked in a month		Avg. No. of Days worked in a month during Trawl Ban		Average monthly income (in Rs.)		Average Monthly Income During Trawl Ban
	E1	S1		E1	S1	E1	S1	E1	S1	E1	S1	
M…												
M…												
M…												
M…												
M…												
M…												
M…												
M…												

Code-5 (a) if fishing/allied	5 (b) if Non-fishing	Code-6	Code-7
Non-motorised fishing-1 Motorised fishing owner-2 Motorised fishing labour-3 Mechanised fishing owner-4 Mechanised fishing labour-5 Cycle fish vending-6 Two wheeler fish vending-7 Headload fish vending-8 SHG Activity-……………9 Others…………………10	Self employed farming-11 Self employed off farm- 12 Animal husbandry-13 Wage employed farming-14 Wage employed off farm-15 Private jobs-16 Public jobs-17 Employment Guarantee Schemes- 18 Others………………19	Old and Same-1 Other means of Fishing-2 Non Fishing (Other works)-3 No other means of employment-4 Others…......................5	Permanent- 1 Salaried-2 Contract- 3 Part time - 4 Seasonal- 5 Others….........6

Remarks...

4. Household Activity History of those engaged in fishing during Trawl Ban

	Gender	Last year	5 years ago	10 years ago	20 years ago
Household Employment Code 8 (1-fishing, 2-non fishing)	Male				
	Female				

5 Are you willing to shift to a non-fishing occupation? ……… **(Yes-1; No-0)**

5 (a) If yes, specify the occupation ……....................................

5 (b) If no, specify the reason? (rank whichever is applicable)

❑Lack of skill ❑ Fishing is more profitable ❑Lack of other avenues of employment ❑ Not provided employment due to my community status ❑Others, specify……………………….

6. House type, ownership and other amenities

SL	Infrastructures		Code 9	Code 13	Code-16
1	House ownership **(Code 9)**		Own/spouse-1	Earth/mud-1	Possession only-1
2	Fund for construction of house**(Code 10)**		Parents- 2	Bamboo/Iron sheets-2	Common Pattayam-2
3	Type of house **(Code 11)**		Relatives -3	Bricks-3	Single individual
4	Floor material **(Code12)**		Rented-4	Others-4,…………	Pattayam-3
5	Wall Material **(Code 13)**		Others-5, ………..		No Possession deed/no
6	Roofing material **(Code14)**			**Code 14**	pattayam-4
7	No. of Rooms		**Code 10**	Thatch grass/palm	Rehabilitated area-5
8	Area of House (Sq.ft)		Self-1	leaves-1	With proper ownership
9	Sanitary latrines **(Code15)**		Govt.Support-2	Iron/tin	documents-6
10	Whether you are using it? **(Yes-1;No-0)**		Other Institutions-3	sheet/asbestos-2	
11	House area land holding **(in cents)**		Friends/relatives-4	Tiles-3	**Code 17**
12	Area of residence (House area land) **(Code 16)**		Others…….5	Concrete-4	House/Piped connection-1
13	Source of Drinking Water **(Code 17)**			Others………… -5	Own well-2
14	Source of water for House uses **(Code 17)**		**Code 11**		Public well/Tap-3
15	Main fuel used for cooking**(Code-18)**		Pucca-1	**Code 15**	Stream/Canal/river-4
16	Source of light **(Code-19)**		Semi Pucca-2	No latrines-1	Rain water harvesting-5
			Kucha-3	Serviceable latrines -2	Others……………-6
				Pucca latrines with	
			Code 12	water supply -3	**Code 18**
			Earth/mud-1		Wood-1
			Cement-2	**Code19**	Kerosene-2
			Tiles -3	Electicity-1	Gas-3
			Others-4, ………	Oil Lamp-2	Electricty-4
				Others……3	Others……………- 5

7. Assets and other Equipments

Name of asset	Owned (Yes-1; No-0)	Numbers
Domestic Appliances		
Television		
Cable /dish TV		
Radio/ Tape recorder		
DVD player		
Fixed/Land phone		
Mobile phone		
Computer		
Refrigerator/freezer		
Mixer grinder		
Gas Connection		
Sewing machine		
Others…………………...		
Transportation		
Bicycle		
Motorcycle		
Auto-rickshaw		
Car/jeep		
Pickup van/goods vehicle		
Others…………….		
Fishing crafts and gears		
Mechanised boat		
Motorised boat		
Small boat		
Fishing net		
Fishing gears		
Others (specify)………………		

8. Current Status of Indebtedness

SL NO	From Whom	(1-yes, 0-no)	Amount (Rs)	Purpose (Code-20)	Collateral (Code 21)	Mode of repayment (Code 22)	Source of repayment (Code 23)
1	Bank						
2	Private Money lender						
3	Kudumbashree SHG						
4	NGOs						
5	Cooperative society/SHGs						
6	Local shopkeepers						
7	Friends/neighbors/Relatives						
8	Other (specify)						
	Total						

Code 20
Education –1
Treatment –2
Purchase of land –3
Marriage –4
Self employment-5
Purchase of fishing crafts and gears-6
Construction of houses-7
Day to day expenditure -8
Other…………. ………-9

Code 21
No Collateral-0
Land-1
Jewelry-2
Salary certificate-3
Other ………… 4

Code 22
Regular-1
Irregular-2
Defaulted-3

Code 23
Own income-1
Borrowed from others-2
Loans-3
Others-4,………………

9. Savings details

9 (a) Do you save? (1-yes, 0-no) ❑

9 (b) If yes, saving pattern? ………. (1-Regular, 2-Irregular, 3-other (specify)....................)

9 (c) Purpose of saving:

(❑ Daily expenses, ❑ Education, ❑ Marriage, ❑ Treatment, ❑Others, specify………)

9 (d) Where do you save?

(❑Bank,❑Post office,❑Chit fund,❑At home,❑Gold,❑Insurance,❑ Others, specify.......)

10. Do you hold/have the following membership/benefits (tick whichever applicable)
  ❑Ration card (APL❑/BPL❑) ❑ Voters ID
  ❑Aadhar Card ❑ Active Bank account
  ❑ Cooperative membership ❑ Insurance cover
  ❑ Health card ❑ Membership in political organisations

11. Do you get financial aid during trawl ban? **(Yes-1No-0)**

11 (a) If yes who provide?................

(Individual-1, Labour Union-2, SHG-3, NGOs-4, Govt-5, Others…….6)

12. SHG/Cooperative Membership

12 (a) Do you think that working with SHG is a best aid for livelihood security during Trawl ban days…… **(Yes-1No-0)**

12 (b) Are you a member of SHGs …………... **(Yes-1No-0)**

12 (c) What kind of member you are?................ (Silent-1, Non-active-2, Active-3)

12 (d) Which type of SHGs you are in? *(SHGs Promoted by)……………………………*

12 (e) Total Members………

12 (f) Whether your group has got any financial assistance…... **(Yes-1; No-0)**

If yes, which agency………. (Government-1; Semi-Gov-2; NGO-3; Others……………-4), specify the name of the agency …………………………………………….

13. Perception of Fisher folks

13 (a) Do you think that the trawl ban is necessary for the resource sustainability?…… **(Yes-1; No-0)**

13 (b) Has trawl ban negatively impacted the livelihood security of the fisher folks?............... **(Yes-1; No-0)**

If yes, rank the impact on a scale of 1 to 5 (1 being the highest impact and 5 the lowest): ………

13 (c) Is there any lose of species? ……. **(Yes-1; No-0)**

if yes, specify………………

13 (d) Has trawl ban resulted in changes in food consumption pattern? ……. **(Yes-1; No-0)**

13 (e) Has technological advancement affected livelihood option in the fishery sector….. **(Yes-1; No-0)**

13 (f) If Yes, Specify the area of employment sector…………
14. Type of gear used for fishing:…………………
15. Crafts used (tick whichever applicable):………………

16. Problems of fisher folks: (Coding: 1 – Strongly agree; 2 – Agree; 3 – Undecided; 4 – Disagree; 5 – Strongly disagree)

	Coding
Livelihood issues	
Decline in some species	
Outsider intervention	
Low skill and lack of technical know-how	
Changes in traditional fish landing centers	
Changes in food consumption pattern	
Linkage Issues	
Changes in catch structure	
Exploitation from middle men	
Inadequacy of governmental assistance	
Erratic earnings	
Lack of alternate employment	
High cost of fishing	
No/low earnings during trawl ban	

17. Perception of fisher folks about effectiveness of Government Schemes (rating)
(1-Very High, 2-High, 3-Moderate, 4-Low, 5-Very Low)

	Coding
Govt. assistance for house construction	
Access to Formal Credit	
Rationing provisions during monsoon trawl ban	
Welfare Schemes	
Alternate Livelihood Schemes	
Matsyafed SHG-Cooperative Linkages	

18. Per Kg share of Catch

Name	Price for fishermen	Retail Price
Seerfish		
Tunnies		
Pomfrets		
Mullets		
Mackerels		
Oil sardines		