

Shrimp Monoculture in India

Impact on the livelihood of coastal poor

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Introduction

The disproportionate growth of shrimp culture in the vast coastal regions of South and Southeast Asia has given rise to several conflicts in the micro as well as macro sphere of shrimp industry chain. Hence the need to examine the advantages and limitations of the rapid expansion of shrimp culture in third world countries become highly relevant.

During literature survey the scope to conduct researches on shrimp culture policy and practices, which are designed at global level and implemented at micro level, has been identified by the present study. The need to identify the main actors associated with this new pattern of agro industrial production and the need to systematically analyse the patterns of interactions of different interest groups associated directly and indirectly with the industry is highly felt. Thus the study has found that the analysis of formulation of global / national policies of shrimp culture, process of implementation of the same and inherent contradictions of such policies etc are critical issues to be dealt with. A great numbers of conflicts that are surfacing in the costal belt of shrimp producing countries and which are influencing the livelihood strategies of the coastal dwellers also call for detailed analysis. However, during literature survey lack of a systematic micro level impact study of shrimp culture on livelihood security of traditional resource users belonging to different economic group was noticed. Hence the initiative has been taken to carry out a micro level case study in two coastal villages of Bhadrak district of Orissa, India and to establish the findings in a broader context of global shrimp chain.

2. Methodology

The present study has tried to analyse the background of development of shrimp culture in India and its impact on livelihood security of traditional resource users in the coastal belt of the country. To this end the study applies the framework of political ecology in order to develop a comprehensive understanding of the shrimp culture problem not only at micro level but also against the background of global political economic transformation. Multidimensional approach of political ecology in general and third world political ecology in particular offers a very useful framework to deal with complex environmental problems arising from shrimp culture.

The emphasis of political ecology framework as used in this present study lies on actor approach to find out the implications of environmental changes in coastal India related to shrimp culture development. This approach has created a space to analyse shrimp culture development in India in the context of the ongoing process of globalisation or in other words in the context of interests of different actors who shape the global market for fulfilling their respective interests. As political ecologists believe that many environmental problems are embedded in the socio-political and economic realities of a state, political and economic aspects of the process of changes regarding patterns of resource use in aquaculture sector in the coastal belt of India has been given due importance. Thus the present study tries to analyse the political and economic compulsions / background of formulation of policies to

promote shrimp culture in India, in the broader context of economic transition of the country. The present study has organised itself in multiple layers while dealing with shrimp culture development in India. These layers are structured as follows:

- **Global level:** Focus on the role of Multi Lateral Institutions (MLIs) in the process of policy formulation and implementation for the promotion of shrimp culture in the third world countries thereby creating a 'politicised environment' of change in the patterns of resource use at micro level. Additionally focus on the role played by corporate capital, consumer demands and resistance of international civil society.
 - **National level:** Focus on the origin and development of national aquaculture policy in general and shrimp culture policy in particular, identification and analysis of the role of different key actors associated with the process of shrimp culture development in India.
 - **State Level (Orissa):** Focus on the state level analysis of development of shrimp culture through promotional policies in Orissa, shrimp culture related institution building by different groups of actors and the emergence of people's resistance.
 - **District Level (Bhadrak):** Focus on the case study of the expansion of shrimp culture in a maritime district and the emergence of a micro level social and economic network of shrimp culture.
 - **Village Level:** Focus on two villages of Bhadrak district i.e. Adhuan and Kismat Krushnapur to find out the impact of the process of change in the local environment induced by shrimp culture on livelihood profiles of villagers belonging to different economic and social groups within the existing 'structure of domination' in the rural set up.

The village level case study was carried out among twenty-five households of Talasai hamlet in Adhuan and equal number of households in Bohumagiri 26 chain hamlet of Kismat Krushnapur. Sample households were selected in such a way so as to reflect a true caste class composition of the greater villages and also depending on the willingness of the households to initiate a process of long time exchange of information and sharing activities. After the preliminary selection of the households, through a series of PRA techniques of survey with the members of selected households as well as with the help of other 'Key Informants' of the villages, sample households were divided into four broad categories.

1. Households always with comparatively high¹ surplus in production / income are termed as Group I households (GI).
2. Households with medium² surplus or Group II households (GII).
3. Households with surplus equal to deficit (that is no surplus but no deficit) or Group III households (GIII).
4. Households with always deficit budget or fourth category of households (GIV).

Thereafter detailed participatory research was undertaken to find out the impact of shrimp culture on livelihood security of the villagers belonging to these four groups.

3.MAIN ACTORS IN SHRIMP INDUSTRY

The present study proposes to divide the groups of actors associated with shrimp scene under two categories on the basis of their association with the shrimp chain from local to global level. These are

1. Place based actors and
2. Non-place based actors.

The case study has revealed that the powerful actors at the local level include state representatives, business houses, influential political leaders, Multi Lateral Institutions and their representatives and local landlords. Whereas the group of powerless actors includes small and marginal peasants and fishermen, agricultural and fish labourers, and gatherers who not only belong to a group of economically weaker actors but also constitute the socially marginalized actors. The unequal power relationship between these two groups of actors enables the powerful group to exert control over the environment of the powerless group, thereby controlling the access of the weaker group to resources leading to further marginalisation of the latter.

The study noted in detail that in a politicised environment of shrimp culture, powerful actors often work in coalition with each other and these powerful coalitions not only control productive resources at micro level but also influence the process of formulation of policies at national and global levels that determine the 'appropriate' use of resources. Participation by traditional users of coastal resources in decision making and process of formulation of policies regarding future use of these resources is totally absent in the case of the shrimp industry. Thus it is observed that the economic decisions and activities of the state, Multi Lateral Institutions and national and Trans-national corporations are jointly causing environmental problems in the coastal belt. Ironically it is the same group of actors that has created the problem now has the sole prerogative of solving it and the weaker actors are forced to play a marginal role in the problem solving process as well.

The other actors associated with the shrimp scene are Community Based Organisation or Non Governmental Organisations of different types with varied objectives and mandates. These actors play an equally important role in the politicised environment related to shrimp culture and the process of change associated with it. Despite being termed as 'powerless' united they have emerged as a strong political force challenging the powerful group of actors.

Finally the legislative bodies of the country are also powerful actors in the national shrimp scene and have played a very significant role in shaping the future of the industry in India. The High Court of Tamil Nadu had issued a ban on all the shrimp farms violating Coastal Regulation Zone Act (CRZ), which was later, upheld by the Supreme Court of India in 1994. Thus virtually all shrimp farm activities (within 500m of High Tide Level) in the country are declared illegal. However, the study observes that the verdict has not been implemented due to lack of willingness of the government administration to safe guard the interest of the industry. Moreover, there has been a constant effort from the government to nullify the court's judgment through the introduction of the Aqua Culture Authority Bill 97 is observed.

Within a few years of its inception shrimp culture activity has raised serious concerns among environmentalists, economists and social activists due to the large-scale externalities, that are never included in the production cost. Attempts have been made by several NGOs to classify the negative impact of shrimp culture into three broadly defined interrelated categories i.e. environmental, economic and social. However, in reality these distinctions are blurred in the perception of common people who are affected by the externalities of the culture. In people's perception shrimp culture has appeared as a new competitor for costal resources i.e. land, water and forest which are essential for traditional coastal dwellers to ensure their livelihood security. NEERI has published a full report on state of shrimp culture

in India and its impact on the environment and socio-economic life of the people. Several grassroots organisations as well as national and international NGOs and ENGOs have published a large number of reports on the impact of shrimp culture.

4. FINDINGS AT GLOBAL LEVEL

The study finds that global actors like MLIs, Corporate worlds, Consumer countries of the first world play significant roles in the promotion of shrimp culture in the third world countries such as in India. The main observations and findings of the study on the global level are briefly as follows:

- The FAO and the WB have formulated policies to introduce the process of shrimp culture in the global fishery sector
- MLIs like the FAO, the World Bank and the IMF have directly contributed to shrimp culture development in the third world countries (e.g. India) by providing multilateral and bilateral assistances.
- MLIs and corporate sectors in shrimp culture have often cited global food security and poverty alleviation needs as justification of shrimp culture development in the producing countries, which in most cases have proved to be a myth.
- The main aim of the MLIs and the corporate world is maximization of the production of shrimp for the global market by initiating a process of control over the natural resources of third world countries and utilizing the same according to the global market demand.
- The geographic distribution of global shrimp production sites clearly indicates the dominance of Southeast Asian and South Asian countries in the business whereas the marketing trend in the global sphere indicates a total dominance of USA, Japan and EU countries as consumers of cultured shrimps.
- Within a decade shrimp has established its position strongly in the export basket of third world countries of Asia. Correspondingly, an increasing dependency of these states on shrimp culture as a source of earning considerable foreign exchange is observed.
- In the era of globalisation and open market economy, the third world countries have a huge burden of debt, compelling them to accept the structural adjustment suggestions put forward by MLIS. Structural Adjustment Programmes emphasise the promotion of export-oriented production like shrimp cultivation.
- A global concern regarding aquaculture activities started taking shape since the mid 90s, which has forced the producer as well as consumer countries of shrimp to come together to discuss the issues concerning externalities of shrimp culture in several international forums. Thus, a number of agreements, plans of action and guidelines including the Code of Conduct for Responsible Fisheries (CCRF) have been developed, although the implementation of these are left on voluntary willingness of the respective states.
- The third world countries mostly with a huge burden of debt do not have enough incentive to implement CCRF and have not made enough serious efforts to control the unabated growth of shrimp culture, which ensures earning of foreign currency for the state.
- Several serious socio-economic and ecological crises have started taking shape in connection with the shrimp culture in the shrimp producing countries.
- A growing awareness of the international civil society regarding the impact of the shrimp industry in the third world countries is gaining momentum, facilitated by international NGOs.

- Sustainability in shrimp culture has become the topic of international debate and all the global actors associated with the shrimp culture are concerned about sustainability, though often with different perceptions.

5.FINDINGS AT NATIONAL LEVEL

The post independence agrarian as well as fishery policies of India are embedded in resource management patterns in the primary sector, introduced during colonial era, which was marked by the abolition of land rights of the traditional users, introduction of private property and integration with the capitalist market of the west. This was reflected in greater degree of commercialisation of agriculture and greater penetration of commodity money relations in the Indian agrarian system on the one hand and increasing poverty, hunger and loss of livelihood security of millions of traditional resource users on the other. Thus a structure of exploitation was imposed on Indian traditional primary resource users, which continues even today though in a changed form, in independent India.

- After independence a few measures had been taken to reduce the extreme economic disparities in rural India albeit only with limited success. The basic exploitative structure has remained the same and the new policies of the government introduced strong capitalist trend in primary sector resource use and production.
- To encounter ever increasing poverty at the prescription of MLIs, Government of India engineered Green Revolution in agriculture in the 1960s and 70s, which though initially increased food production but in the long run led to centralised control of the trade in food grains and made farmers dependent on corporate sectors for various inputs. Green Revolution thus paved the way for introducing similar packages of technocratic solution of production and food security problems in other fields of primary resources i.e. forest, live stock and water management which are well known as Social Forestry, White Revolution and Blue Revolution, in Indian economy.
- At the same time the policy of the Indian government to promote massive industrial development resulted in the abolition of several restrictions on production to liberalise the entire economy of the country. The new liberal policy of India introduced in the early 80s is well known for opening up the Indian market for foreign investment. On the one hand subsidies and several other incentives were introduced to lure private entrepreneurs into investing in export oriented production and on the other hand huge reduction of subsidies were announced in traditional agriculture and fishery sectors.
 - This policy of liberalisation in the 80s was followed up by the new economic policy of the 90s, the aim of which was to generate growth, relying on market forces or, in other words depending on resource mobilisation and investment.
 - Extreme focus has been given to expansion of export oriented production during this phase as the government had to accept huge loans from the International Monetary Fund (IMF) with certain conditions of 'Structural Adjustment' of India's economy in order to deal with the Balance of Payment Crisis of the nation. Special schemes have been announced for EOU (Export Oriented Units) and Aquaculture / shrimp culture has been identified as a major thrust area.
 - The Coastal Aquaculture Project of 1986, first launched shrimp mono culture officially in the country in the sixth five year plan (implemented during 1988-93) and offered special infrastructure facilities to Multinational Corporations (MNCs), Trans-national Corporations (TNCs) and the national corporate sector to invest in shrimp culture.

- The Brackish Water Fishery Development Authority (BFDA) and Marine Product Export Development Authority (MPEDA) have been established to ensure smooth development of shrimp culture.
- Government of India also received multilateral assistance from the World Bank and development aid for aquaculture projects from consumer countries like Britain. Different federal governments also came forward to welcome this foreign exchange earning industry and introduced special facility packages for attracting investment in their respective states.
- Thus shrimp monoculture which is an input intensive, species specific commercial culture of brackish water shrimp gained momentum in India in mid 90s and total potential area for brackish water shrimp culture was estimated to be 1,190,800 hectares among which 13,816 hectares are under cultivation in 2000.
- With an annual production of 70,000 metric tons of shrimp India became fifth in shrimp production in the world in 1998-99. The contribution of shrimp to India's export reveals why the government has taken such a promotional role to develop the industry. By 1997-98 India had registered the export turnover of Rs. 4,120 crores³ of which shrimp alone contributed 2,700 crores.
- The cultured shrimp hence contributed 43% in quantity and 60% in value of total aquaculture exports of India. The foreign exchange realised registered a growth of 14%, which indicated a 23% growth in three years. Major markets of Indian shrimp are Japan, USA and EU countries.
- Thus within a decade commercial shrimp monoculture has replaced the traditional brackish water shrimp culture system in India which were practised by coastal communities for generations. These traditional practices were different from one coastal state to another and were low input, natural shrimp production system that was often carried out in rotation with paddy or other types of aquaculture.
- Though the production in traditional farming was not enough for earning huge amount of foreign currency but was sufficient to meet local demands and needs of the producers and consumers of the coastal belt.

6. FINDINGS AT STATE LEVEL

Orissa is a maritime state of India with five coastal districts and a long coastline of 480 km. The state is considered one of the backward states in the country with respect to social and economic development as well as industrialisation. The state economy is primarily dependent on primary sector economic activities. Millions of coastal dwellers of Orissa depend on fishing, agriculture and gathering activities to make their livelihood. Poverty and unemployment are immense problems for the state as 49% of rural population lives below the poverty line and the level of unemployment is around 784,000 in 2001 as estimated by the planning commission during the Ninth Plan (1998-2003).

With this background the state government has introduced shrimp culture project under the BFDA scheme ostensibly to alleviate poverty and to create rural employment opportunities. Regarding aquaculture potential the state stands fourth in the country but with respect to intensification of production and total production the state has very recently achieved the second position after Andhra Pradesh (2000). Rapid expansion of the industry took place in mid 90s in the state with active implementation of government policies and the efforts of the local government administration and a significant growth of allied industry of shrimp in the state has also been observed during this phase. Shrimp culture is contributing to 77% of total export of the state in terms of quantity and 92% in terms of value.

Orissa exports 98% of the cultured shrimp that it produces. Big national companies as well as MNCs and TNCs have invested huge amount of money in aquaculture in Orissa along with financial assistance and projects of World Bank. The shrimp industry in Orissa is comparatively new considering the history of shrimp culture in Andhra Pradesh and Tamil Nadu and the industry is still carrying out intensive to semi-intensive patterns of production here which are practised less elsewhere in the country nowadays. The major observations of the study at state level are briefly as follows:

- A state level collaboration between the government, MLIs and Corporate sector is observed which shapes the future trend of the shrimp industry and coastal resource use.
- The state government fully supports the industrialised shrimp culture and has given it the special status of agriculture as well as industry in the new agricultural policy of the state, thereby allowing the culture within CRZ in many cases.
- The objectives/target of the BFDA project of shrimp culture in Orissa to generate income opportunities among resource poor households failed miserably due to contradictions in the government policies, poor coordination between several government departments and the poor process of implementation.
- The government project failed to develop public sector enterprises in shrimp culture and in allied industries and this sector is controlled by large MNCs and TNCs in the state
- The BFDA project failed to protect small and marginal shrimp farms and most of the small shrimp farms depend heavily on large shrimp companies for inputs and post harvest processing. They are forced to accept highly unfavourable conditions/contracts as offered by the large companies.
- Large scale alienation of coastal traditional resource users from productive resources has taken place all along the coastal Orissa and several socio-economic and environmental conflicts are coming to the fore in the coastal belt as a result of shrimp culture
- The Supreme Court judgement is only partially implemented in the state and the majority of the shrimp farms are continuing their production unabated.
- A strong state level NGO movement against shrimp culture is gaining momentum, in Orissa with linkages to various national and international NGOs as well as with grassroots organisations in the state.

7. FINDINGS AT DISTRICT LEVEL

The present study selected Bhadrak district of Orissa for a micro level case study, where most of the World Bank projects are in operation and from where the anti shrimp culture movement emerged in the state. The main findings in the district of Bhadrak are as follows:

- The shrimp network in Bhadrak shows characteristics similar to those at state level and powerful actors of shrimp culture are often found working in collaboration at district level also.
- Bhadrak district has the highest intensity of shrimp culture in Orissa.
- Large-scale identification and conversion of private agriculture land to shrimp culture has taken place in the district.
- A strong vertical integration in the shrimp industry exists in Bhadrak and only three large companies dominate the shrimp scene while small farms have become contract farmers to these large companies.
- Bhadrak has received financial assistances from the WB and MNCs have invested huge amount in the shrimp industry in this district.

- District level political leaders and government officials are often found to be engaged in shrimp business in Bhadrak.
- Lack of communication among different government departments is often observed in the district, especially in the context of aquaculture development, and data regarding shrimp culture is very poorly developed in Bhadrak as it is a newly built district (1993).
- When conflicts regarding the legitimacy of shrimp culture in the coastal belt of the district arise, district officials often tend to interpret regulations in ways, beneficial to the shrimp industry.
- The BFDA project in Bhadrak has failed to create employment opportunities among resource poor households through shrimp culture project.
- The BFDA has also failed to develop infrastructure for the shrimp industry in the district and therefore allied industries of shrimp (hatcheries, processing and packaging unit, etc.) are very poorly developed in the district.
- Thus the district earns only from the production of raw shrimp and not from the value added products of shrimp which could be economically more profitable
- Large-scale socio-economic and ecological problems arising from shrimp culture are found in the district.
- The Supreme Court judgement directing demolition of shrimp farms falling under CRZ is not well implemented in the district
- A growing mass awareness against shrimp culture activities is noticed in Bhadrak.

8.FIELD SURVEY: ADHUAN AND KISMAT KRUSHNAPUR

A village level case study was carried out in two coastal villages of Bhadrak district of Orissa, India, namely Adhuan and Kismat Krushnapur. The study was undertaken from April 1998 to January 2000. Rapid Rural Appraisal and Participatory Rural Appraisal techniques have mostly been used for the case study, along with standardised questionnaire survey, mainly with shrimp farm owners and employees as respondents.

The main objectives of the village survey were as follows.

- To understand Village dynamics.
- To develop understanding about socio-cultural scenario of the villages.
- To survey present and potential village resources both natural and human.
- To identify different economic groups in the villages.
- To document the income opportunities of these various groups.
- To study livelihood strategies of the households under a normal condition.
- To study the responses of different groups of households to specific changes at their local level environment.
- To observe the patterns of interaction of the villagers with the shrimp industry and to examine conflicts arising out of these interactions.
- To study the patterns of changes in coping strategies of different groups of villagers to ensure livelihood security in the context of changing rural environment due to shrimp culture activities.
- To understand how natural / spontaneous groups (i.e. resistance groups) emerge in villages in response to specific situations and needs arising out of households' changing access to resources due to shrimp culture in two study villages.

A detailed participatory survey in shrimp farms was also conducted with the following objectives:

- To gather information about the significance of the industry in the local socio-economic setting.

- To understand the rural network of shrimp farming and its connection with the national and global sphere.
- To determine the most powerful actors and their interest, associated with the industry at rural level.
- To find out everyday and long term patterns of interaction of interests of the shrimp industry with the local inhabitants.
- To document the shrimp farmer's perception of conflicts associated with the industry in the study area.
- To document the response of the industry to new legislative development and to the emerging people's resistance against the farming.

For analysing the coping strategy of the villagers belonging to different economic groups in Adhuan and Kismat Krushnapur the study followed the basic concept of the model of double structure of vulnerability as proposed by BOHLE (2001). Applying this model, the exposure to risks, the villagers of Adhuan and Kismat Krushnapur are threatened from in a normal exploitative rural economic structure, was analysed. Further this concept helped to understand how the process of change induced by shrimp culture is affecting the livelihood strategies of the households and influencing the households' capacity to cope with a changed situation in a short and long term thereby determining the degree of vulnerability of the households. Thus following the concept of vulnerability as elaborated in the model the varied access of the villagers to different natural and social productive assets were analysed. The access model as proposed by BLAIKIE 1993 is also used to develop a structure for household survey, analysis of livelihood opportunities and asset of the villagers and thereby understanding the existing 'structure of domination' in the rural set up.

9. THE FINDINGS OF THE CASE STUDY AT VILLAGE LEVEL

Adhuan is a village mainly inhabited by schedule caste fishermen community suffering from poverty and deprivation. Kismat Krushnapur however is a village of migrant peasants mostly belonging to higher castes with slightly better economic conditions than those of the people in Adhuan. Both of these villages have been exposed to shrimp culture activities and externalities since the last ten years. Three large shrimp companies along with two small shrimp farms are found in these villages. The shrimp farms are constructed mostly on coastal agricultural land, on mangrove areas and often encroached upon Common Property Resources (CPRs) of the villages, which often cause immense tension between the shrimp farm owners and the villagers.

9.1 LIVELIHOOD STRATEGY ANALYSIS OF SURVEYED HOUSEHOLDS

In Adhuan and Kismat Krushnapur the analysis shows that almost 90% of GI families are literate, all of them belong to upper castes, many are engaged in business or service within and outside the villages and a few also play a crucial role as village moneylenders. Generally they accumulate enough surplus to reinvest either in their primary sector of productions or in savings and these house holds have good access to institutional credit. These households are also the major entrepreneurs of the village, employing several wage labourers in the agriculture and fishing sector.

Land holding pattern suggests that the concentration of high quality and larger plots of land are owned by these households and their access to other productive assets is also very

good. These households enjoy considerable political power in the locality and have good nexus with local bureaucrats. Due to the economic and social compulsions of the poor families these households often enjoy extra constitutional power in the village parliament, despite being minority.

In Adhuan the income of GI group is derived approximately 12% from fishing, 57% from agriculture and 31% from other sources. Other sources also include interests from loans they give out as local moneylenders. In Kismat Krushnapur the income of GI households comes 68% from agriculture and 32% from other sources. The access to productive assets like land, capital, forest and water as well as access to education is quite high for this group.

This economic power along with their higher position in Hindu caste hierarchy enable them to gain a social and economic position of superiority in the village. In Kismat Krushnapur most of the households belonging to this group are large peasants while in Adhuan it was a combination of large peasants and fishermen households. These households have considerable contribution to strengthen the existing exploitative economic and social structures in these study villages.

GII group in Adhuan and Kismat Krushnapur has seven households each. They can be classified as well to do class with good access to education, political and social power. Most of them have their own assets to carry on production and manage to create savings. The households in Adhuan earn mainly (27%) from fishing, (45%) from agriculture and (28%) from other sources While in Kismat Krushnapur income of these households mainly comes from agriculture (53%) followed by other sources (47%) including wage labour in agriculture sector.

Most of these households possess their own agricultural land, a part of which is usually rented out for sharecropping. Although economically they stand below GI, they manage to maintain a profit profile almost throughout the year and generally do not have to borrow money for consumption or crisis. These households also have access to credit from banks and cooperatives for expansion of their income opportunities under various rural development schemes. In Kismat Krushnapur seven households, which belong to GII, have however stronger economic positions in comparison with households of GII in Adhuan, mainly due to earning from permanent well-paid services.

The important distinction between this group in Adhuan and Kismat Krushnapur is that households of Kismat Krushnapur are often found to be engaged in small business as a secondary source of income generation, which is by and large absent in Adhuan. The other sources of income in Adhuan relate mainly to services among this household group. Socio-economically and politically GII household group mostly enjoy secure position in Villages. In Adhuan eleven households fall into GIII where as in Kismat Krushnapur this group consists of ten households.

In Adhuan almost all of these households belong to the scheduled castes, on the other hand in Kismat Krushnapur they belong mainly to higher castes. The households belonging to this group in Adhuan derive 16% of their income from fishing, 17% from agriculture, 31% from fish labour, 26% from agricultural labour and 10% from other sources which mainly include gathering and small business such as net weaving or handicraft. In Kismat

Krushnapur this group derives their income 38% from fishing, 23% from agriculture, 9% from wage labour in fishery sector, 16% from agricultural labour and 14% from other sources, which include mainly small household business.

It may be mentioned here that in both study villages, households belonging to this group tend to have more diversified sources of income than GI and GII in general and are more dependent on wage labour and share cropping in combination for household food security. However with stagnation in wage structure these households are becoming increasingly vulnerable to even a minor change of the economic or ecological environment.

This household group belongs to the group of no surplus and no deficit category in general. Although these households generally do not have to borrow consumption loans but having no considerable savings they are always vulnerable to deficits in household budgets if a special need for money should arise, such as any social occasion, rise in the costs of inputs for agriculture, necessity of buying new instruments for productions or any other family emergency. 53% of these households are found to be indebted to local moneylenders and some (6%) even to banks (agricultural cooperative loan) and are not in a position to repay them within stipulated time. Thus most of these households live under a constant threat of economic disempowerment.

The level of literacy in these households is lower in Adhuan than in Kismat Krushnapur. Although officially these households are considered as socially marginalized households but they do not fall Below Poverty Line (BPL) and are therefore not entitled to receive special subsidies from the government. However households belonging to this group often get turned into BPL households with a crop failure, reduced access to productive resources like alienation or degradation of land, loss of employment or due to any sudden changes in their socio-economic framework.

Five households each fall in GIV both in Kismat Krushnapur and Adhuan. In both villages these households belong to the category of acute grain deficit and fail to earn or produce enough for subsistence. All GIV households in Adhuan belong to scheduled castes and in Kismat Krushnapur a combination of scheduled castes and other socially marginalized/backward castes.

This group derives its income from different types of economic activities in combination, showing a great degree of seasonal diversification in sources of income, which basically reflects the resource poor condition of the households. In Adhuan GIV households earn 24% from fishing, 8% from agriculture, 24% from fish labour, 31% from agriculture labour and 13% from other sources, which refer mainly to gathering. In Kismat Krushnapur the households sources of income come 20% from agriculture including sharecropping, 27% from fish labour, 41% from agriculture labour and 12% from other sources including gathering.

These ten households in both villages are considered as BPL households by the government and hence are entitled to receive subsidies. However, this help is really insignificant in comparison to their needs as revealed in the study. The average size of a household is ten in this group with more than 50% being dependents and facing a constant deficit of grains. Most of these households do not possess their own land or any other productive assets. Therefore they depend entirely on labour. With a stagnation in wage and a high burden of consumption loan on them the economic as well as social condition of these

families have become worse over time and have increased the degree of social and economic marginalisation of these households.

These households depend very much on Common Property Resources to earn a small income everyday. Therefore changes in access to Common Property Resources hit this group of households hardest. Literacy rate is very poor and almost all women belong to these households are illiterate. GIV households do not have any access to bank credits. Although these households come under various rural development and poverty alleviation schemes of the state as well as the central government, they seldom receive any such assistance. In addition to this their poor say in local politics and decision making power and poor access to information and education have worsened the situation.

Among the most common coping strategies adopted by grain deficit households working as wage labour both in agriculture and in fishery sector is most important. This requires physically able adult members in the households and indeed the study reveals that households of GIII and GIV, which have more adult members than others, cope better with deficit problems in comparison to the other households of the same group. Having large numbers of dependents are disadvantages to the households belonging to GIII and GIV. Sizes of the households are also crucial in coping up with deficit. Households of GIII are comparatively smaller in size and hence do better in coping with food insecurity. Access to subsidised food given by the government is important for the food security of GIII and GIV households.

The study also revealed that for GIV households in particular and GIII households in general access to common property resources are of primary significance. Household survey revealed that while households of GI and GII spend 6% and 4% of their income respectively for buying firewood and fodder, households belonging to GIII can only spend 1% and GIV depends entirely on gathering to maintain their livestock and to collect firewood for everyday use. Thus any changes in access to pastures or mangroves destabilise the capacity of these resource-poor households to cope effectively with changes induced in their everyday environment due to certain development.

The study has also observed that with reduced access to CPR the households of GIII and GIV have to depend increasingly on remaining CPR that is still accessible to them and in this process contribute to the destruction or degradation of CPR. This is a vicious circle as the degree of negative dependence on CPR increases with reduced access to CPR and increased degree of marginalisation of these households and vice versa.

9.2 CONFLICTS ARISING OUT OF SHRIMP CULTURE ON THE COASTAL BELT

The main interactions between villagers and the shrimp farm owners are limited to a few areas and the processes of these interactions give rise to a numbers of conflicting situations both in Adhuan and Kismat Krushnapur as revealed during the study.

The survey revealed the following areas which bring villagers and shrimp farm owners in direct interactions / transactions and from time to time to confrontations.

Major Environmental and ecological issues leading to conflict

- Most of the farms are situated within 500 m of HTL which come under CPR

- Conversion of agricultural land and land under salt production to shrimp farms is a common practice in these two villages
- Brackish water shrimp culture has been installed in ecologically fragile regions.
- Natural and artificially made saline canals coming from the sea into the mainland area being used for shrimp culture. The flow of the natural saline canals is being obstructed due to prawn farming activities, which has resulted in the spread of brackish water over agricultural farms resulting in loss of agricultural lands (salinisation) and potable water.
- Loss of landing grounds for traditional fishermen for fish catch is constant source of conflict among villagers of Adhuan.
- Coastal aquaculture has resulted in loss of mangrove eco-system which provided protection against cyclones and other natural hazards, and which provide natural habitats for spawning or marine breeding. This in turn affected wild catch of shrimp for local fishermen.

Coastal farms are situated in ecologically unsuitable areas. No proper peripheral drainage has been provided around the farms. The saline water intake and effluent discharge points are located in close proximity to agricultural fields and natural water bodies. These activities resulted in degradation of agricultural land, loss of fish catch, degradation of fragile coastal land.

- Fencing around the farm by large companies and the consequent blocking of free access for villagers to the seashore.
- The waste water discharge from the aquaculture farms released into the creeks is not properly flushed out of the creek during low tides thereby leading to the accumulation of pollutants in the creek and in turn affecting the quality of intake water for aquaculture farm
- Disappearance of native fish species due to increase salinity and wild seed catch of shrimps thereby destroying other species seeds.
- Unscientific management practices leading to skin and water borne diseases in the contiguous population.
- No contribution to develop social infrastructure facilities by shrimp farms (such as building of roads, electric supply, drinking water facilities). No employment opportunities available to the villagers and traditional employment opportunity reduced resulting in migration to nearby towns and cities.
- Shrimp farm's tendency to encroach upon government land and also forcing the agricultural land owners/salt making villagers to sell their land.

Major Socio cultural and Economic issues of conflicts:

- Land alienation of poor households due to pollution and conversion and due to forced selling of land
- Loss of employment as share croppers, agricultural labourers
- Loss due to cutting of mangroves in terms of fuel and other uses.
- Loss in terms of grazing grounds due to encroachment on CPR
- Loss caused by cyclones due to destruction of coastal vegetation
- Loss due to desertification of land
- Loss in terms of potable water
- Loss in fishing income
- Loss due to damage of productive assets i.e. fishing net
- Loss of man-days due to non-approachability to seacoast
- Loss of marine biodiversity
- Loss of Health and spread of diseases

- Social and economic disempowerment particularly for women belonging to poor economic household
- Loss of traditional rural culture, value system and security

The main concern of grassroots actors associated with shrimp culture is the loss of livelihood opportunities and denial of access to natural resources on which they have depended on for generations. Economically marginalized actors in general have less access to assets and productive resources than other actors and a few among them cannot generate the minimum income for their existence. The degree of dependence on environmental resources increase with the degree of social and ecological marginalisation of the households. It may be mentioned here that the marginalized actors are also not a homogeneous group and some among them are more marginalized than others (women, children).

The study shows resource poor actors depend heavily on access to natural resources and CPR for compensating deficit in household's income. The management of CPR is complex and varies from community to community and from one place to another. However, the study has pointed out that common point in management of CPR should be the understanding and recognition of the fact that indigenous people have a better understanding of local environmental resources and they often practice the most effective environmental management system, allowing economic use of the resources and at the same time assuring the conservation of the same as observed during the case study.

Thus the study also proves that an imposed model of development on the coastal traditional resource users by powerful actors will tend to either fail or generate conflicts if the perceptions and knowledge of traditional resource users are not incorporated in the planning, formulation and implementation of any projects concerning use of productive resources at micro level.

9.3 RESISTANCES OF COASTAL 'POWERLESS ACTORS' AGAINST SHRIMP MONOCULTURE

The resistance against the shrimp industry at national level in India began in 1992 and gained its momentum in 1993-94. The activists formed a platform People's Alliance Against Shrimp Industries (PASI) comprising leading social groups and community leaders such as Mr. S JAGANNATHAN (Land For Tiller Tamil Nadu) Mr. Jacob RAJ (Prepare Andhra Pradesh) Mr. B. DAS (Orissa Krushak Mahasangha, Orissa), Ms. Vandana SHIVA (Research foundation for science and ecology New Delhi) and Mr. Claude ALVARES (The Goa Foundation).

The marginalized actors of Adhuan and Kismat Krushnapur have found it often difficult to directly protest against the powerful actors of shrimp industry. Thus different strategies of protests are observed in these two villages. In general a constant effort has been made to avoid direct confrontations with powerful actors in shrimp industry in the locality which are reflected in certain changes of household survival strategies such as selling out of polluted land at very low prices to shrimp farms or going long distances everyday to fetch drinking water by the village women etc. which could be considered as adaptive response to cope with the changed economic condition.

Yet another response by marginalized households is to look for new opportunities of income generated by the new development of shrimp culture in the locality. This is reflected

in the participation of women and children in large-scale collection of wild seed of shrimps from nearby rivers and estuaries to sell it to the farms. Last but not the least way of adaptation to this new situation is observed in migration of two members of two marginalized households in Adhuan and one household in Kismat Krushnapur to nearby towns in search of alternative income opportunities. This reflects the constant efforts of the marginalized groups to adapt with the changing economic and environmental condition.

However as seen in Adhuan and also in Kismat Krushnapur these short time coping strategies or resistances have limitations and can not solve the basic conflicts that have taken shape as a result of environmental changes due to shrimp culture practices in the village. Thus the marginalized groups in Adhuan and Kismat Krushnapur have turned to direct resistance. A number of incidents of stealing shrimps from the farms or cutting woods from the shrimp farm campus and even stealing fuel like diesel etc. from the shrimp farms are noted. This can be termed as 'everyday forms' of resistance.

In Adhuan the long standing history of common struggle against colonial rulers has prepared a common base for the marginalized households to come together in order to form a grassroots organisation to put up united fight against the oppression of shrimp farms which has not be seen in Kismat Krushnapur. The formation of such organisation in Adhuan started with the incidents of clashes between a shrimp farm and the agitated villagers over the issue of taking possession of CPR. Thereafter, a renowned social activist, Mr. B DAS had facilitated the process of consolidation of the spontaneous resistance and had given it the shape of a systematic grassroots organisation.

The present nature of the grassroots organisation existing in Adhuan is of 'Protest Organisation' type but recently it is also trying to take initiatives in helping its members and other affected households in the community to look for alternative living strategies and employment opportunities etc. The main aim of the grassroots organisation in Adhuan is to publicise the illegal work of the shrimp farmers in the locality and the adverse effect of the same on the life of the rural community.

The grassroots organisation of Adhuan receives the constant support of national level Non Governmental Organisations i.e. Orissa Krushak Mahasangha and Orissa Matsajibi Mahasangha. Adhuan's grassroots organisation has also received supports of various other Environmental Non Governmental Organisations of national and international repute. International Environmental Non Governmental Organisation like Greenpeace, Mangrove Action Projects, Earthlink Samudra etc. highlighted the struggle of weaker actors of Adhuan in their international publications. However, during the formation of the grassroots organisation in Adhuan many villagers have joined in it with diverse expectations and interests, which sometimes have caused hindrances to the original activities of the organisation as observed during survey. As is evident the dependency on national and international level Non Governmental Organisations is in a sense unavoidable, and brings considerable influences of the donor organisations on the work of grassroots organisation like Adhuan.

Sustainability in shrimp culture is becoming the main issue among the powerful actors to legitimise the continuation of shrimp culture in the coastal areas and to counter balance the attack of the environmental activists on the shrimp industry. While grassroots actors and

NGOs of all level also talk to promote sustainability in shrimp culture their approach to implement sustainability clearly differs from that of the powerful actors. The common point in perception of powerful actors regarding 'sustainability' is to look at the whole issue from the point of view of production maximisation and to touch briefly the aspects of environmental conservation to avoid large-scale criticism.

The Food and Agricultural Organisation (FAO) has developed a Code Of Conduct For Responsible Fishery (including shrimp culture) towards sustainable management practices of shrimp culture in its member states. The government of India along with other member countries of Food and Agricultural Organisation, have voluntarily agreed on the necessity of adapting strategies to cope with the changed scene of shrimp culture in the country.

To corporate actors however sustainable development in shrimp culture refers to such an ideal situation of production, which will assure large-scale profit with selective environmental conservation (like less intensity in production to avoid disease problems and self-polluting effects).

World Bank also tries to incorporate sustainability in its shrimp culture projects which mainly aim at ensuring large scale production and profit without disease problems and ensuring supply of shrimp to global market. This gives rise to strong doubt on the genuine willingness of the Multi Lateral Institutions to adapt a pro people sustainability approach in shrimp culture in India.

10. CONCLUSION: DEBATES ON STRATEGIES TOWARDS SUSTAINABILIE SHRIMP CULTURE

Sustainability is the main topic of the hour among the grassroots actors and NGOs. However they have a different understanding of sustainability, which refers to the short, and long-term livelihood security of traditional resource users and conservation of fragile ecosystem under the management of the coastal dweller. The study has found that there are opportunities for sustainable shrimp cultivation but several human and environmental factors have to be taken into consideration.

Since shrimp culture development is dependent upon the entire coastal ecological system, coastal zone management is crucial for sustainability. It is necessary to take an integrated approach to manage natural resources in the coastal belt for the benefit of the majority of population. The results of the present study about current methods of shrimp farming and its impact on the environment clearly indicate the serious need for reforms in the existing patterns of shrimp farming.

The whole approach of the initiative to make shrimp farming sustainable from the side of the powerful actors is concerned mainly with the control of environmental degradation (to a certain extent) which additionally will make the conflicts less severe. However, several studies (as well as the present case study) have established the fact that as long as shrimp aquaculture continues to take place in its present form in the coastal environments, all shrimp culture enterprises will be a constant threat to the right of traditional resource users. Thus we see MAP has rightly pointed out:

“Besides putting an emphasis on ‘environmental diagnosis’ and corrective mechanisms to enable shrimp industry to work in a sustainable way in third world countries, the major need is to initiate a ‘mandatory social analysis’ to determine who exactly are the beneficiaries of shrimp aquaculture development (MAP 1996)”.

Therefore the present study has emphasised to find out not only the environmental or economic costs of the eco-degrading shrimp culture but also the social costs or burden borne by the traditional resource users in the coastal belt. The study has found that the traditional resource users of the coastal belt can only bring a meaningful change in the present pattern of resource extractions by the alien shrimp farms if they raise their voice against the ongoing exploitation and participate actively in developing an alternative to the shrimp monoculture practice. To ensure stability and balance between multiple coastal resources and its use Community based coastal zone management (CBCZM) approach could be initiated (as suggested by many NGOs in several international seminars concerning coastal resource management) which will create scope for the traditional resource users to use their resources according to the local need keeping in mind the demand of the future generation. This approach recognises the rights of local communities to develop their plans for regional coastal management as also mentioned in CCRF of FAO and could be implemented in shrimp culture management as well.

The present study has documented traditional sustainable practices of shrimp culture. The study found that this traditional knowledge is often neglected by powerful actors including NGOs. In the developing countries this has often resulted in a constant effort of imposing an alien resource management practice on the coastal traditional resource users in the name of implementing sustainable resource management programmes (MAP 1996). The study reaffirms the need of initiating an effective coastal zone management programmes in order to document and maintain the traditional knowledge of the local people which is often neglected in the model of so called modern development practices. The local resource management with full participation on the part of coastal traditional resource users should also be facilitated by the state by providing adequate legal and the administrative framework to support traditional coastal management systems, which is also time and again highlighted in CCRF but not implemented in its member countries. The strategies of sustainable management must be evolved in a participatory way. To ensure sustainability the basic philosophy of the traditional resource management practices that have a social, cultural and spiritual base, should be taken into consideration. Therefore all actors associated with the industry should be careful to have a holistic understanding about traditional systems of aquaculture while attempting to achieve sustainability in aquaculture practices.