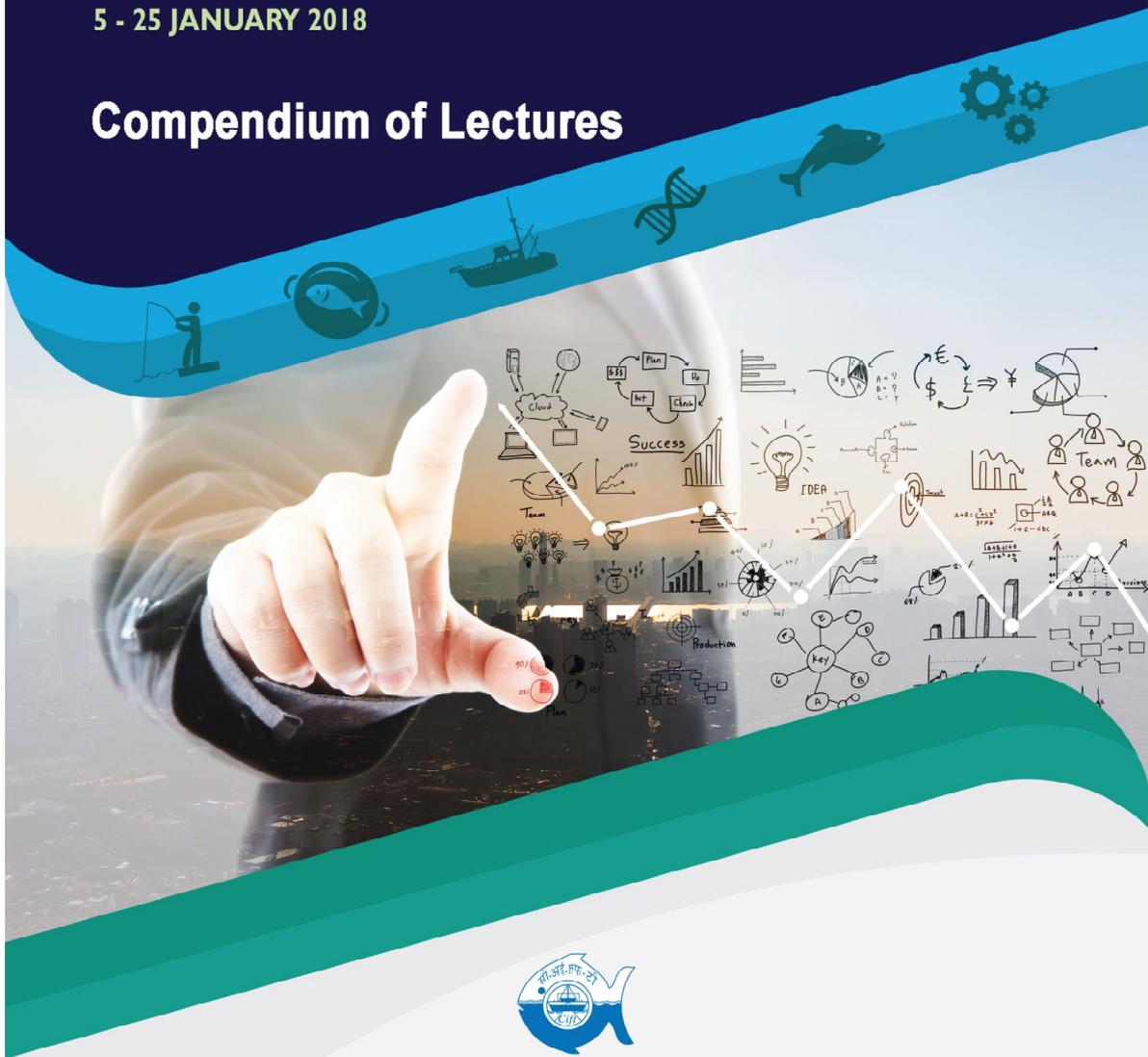


**ICAR Sponsored Winter School on  
Enhancing Farm Income  
through Entrepreneurship Development  
in Fishing and Fish Processing**

**5 - 25 JANUARY 2018**



**Compendium of Lectures**



**ICAR - CENTRAL INSTITUTE OF FISHERIES TECHNOLOGY**

Matsyapuri P.O., Willingdon Island  
Cochin - 682029, Kerala

# ***Compendium of Lectures***

**ICAR Sponsored Winter School**

**on**

## **Enhancing Farm Income through Entrepreneurship Development in Fishing and Fish Processing**

**(05-25, January, 2018)**

**Venue: ICAR- CIFT, Cochin, Kerala**

**Course Director**

**Dr. A.K. Mohanty**

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**Dr. M.V. Sajeev**

**Dr. V.K. Sajesh**

**Dr. K. Rejula**

**2018**



**भाकृअनुप - केन्द्रीय मात्स्यकी प्रौद्योगिकी संस्थान**  
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### **Message from Director**

ICAR-Central Institute of Fisheries Technology was established as Central Fisheries Technological Research Station CFTRS on 29<sup>th</sup> April 1957 and completed 70 years of existence with Diamond Jubilee Celebrations in 2017. This pioneer research institute in fisheries research in India is pursuing its research in evolving cost effective technologies in harvesting and post harvest in fisheries with the involvement of highly qualified scientists. Indian fisheries sector being a highly foreign exchange earning one, stimulates growth of subsidiary industries assuring availability of affordable nutritious food for socio-economically backward small farm holders. Hence there is immense need to develop trained manpower to venture for fishery entrepreneurship. In this context, I am very happy that ICAR has sanctioned 21 days Winter School on '*Enhancing Farm Income through Entrepreneurship Development in Fishing and Fish Processing*' which is very relevant in current scenario. It is encouraging to find that the editors have taken a real time proactive initiative to compile this manuscript to address the issues pertaining to scopes and opportunities for entrepreneurship development in the field of fishing and fish processing. This compendium delineates the concepts, issues, related reviews and relevant technologies in the concerned field for developing entrepreneurship in fisheries. I hope this publication will be useful for entrepreneurs, academicians, researchers, scholars, policy-makers and planners as well as developmental experts to formulate strategy on this line. I congratulate the contributors for their painstaking efforts for their write-ups to give a shape to this compendium. I wish my heartiest gratitude to the editors to take such a scholarly endeavour to bring out this valuable publication as a guide to entrepreneurs and policy makers to face the future challenges in fish-preneurship. My hearty congratulations to the participants of this programme who came from different parts of the country and I wish Dr. A.K. Mohanty and his whole team at Extension, Information and Statistics Division for smooth and successful conduct of the programme.

Dr. C.N. Ravishankar  
Director



## **Message from Editors**

The economic growth of a country is largely attributed to commodity based entrepreneurship development in various sectors which brought out the concept of entrepreneurship with the objective of developing small-scale industries. In spite of India's high-profile economic growth in recent times, more than 300 million populations still live in poverty, in which more than two-thirds of the population depend on agriculture and allied sectors for their livelihood, which is largely at small-scale or subsistence level. Today, Indian fisheries is considered as a sunrise sector with high potential for rural development, gender mainstreaming, food and nutritional security as well as export earnings that can be treated as an enterprise in the form of a rural entrepreneur-led hybrid model for small scale. Being a potential foreign exchange earner, this sector stimulates growth of subsidiary industries assuring availability of affordable nutritious food for socio-economically backward small farm holders. Hence, the entrepreneurial opportunities involved in fisheries sector have to be rightfully explored and utilized through entrepreneurial motivation, technology empowerment, skill up-gradation through different management techniques and sustenance mechanism. Realizing the importance of entrepreneurship issues in fisheries, it is really imperative to evolve some tailor-made manuals aimed at providing knowledge and skill on the conceptual themes and relevant technologies. The contributors of this book have really made a commendable effort to bring out well researched articles which resulted in such a nice and precious publication. We hope this compendium will be a road map for the entrepreneurs, researchers and policy makers to take up any new venture in the field of fish-entrepreneurship.

Editors:

Dr. A.K. Mohanty  
Dr. Sajeer M.V.  
Dr. Sajesh V.K.  
Dr. Rejula K.



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## **Establishing Fish Based Enterprises for Livelihood Security: Scopes and Opportunities**

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*The basic reason for poverty is not nothingness..... It is the tendency of unwillingness of human mind for sharing the available, inability to make use of opportunities effectively and lack of willpower.....Technology for a micro-enterprise is a 'game' for the rich, a 'dream' for the poor and a 'key' for the wise. (Kudumbashree, Kerala State Poverty Eradication Mission)*

It is an unequivocal proposition that, fisheries sector occupies a paramount position in the socioeconomic development of our country. Fisheries, aquaculture and fish based enterprises are considered the sunrise sectors in India, providing nutritional security, contributing to the nation's GDP and offering employment to over 14 million people directly and indirectly. Constituting about 6.3% of global fish production, the sector contributes to 1.1% of the GDP and 5.15% of the agricultural GDP (NFDB, 2016). The extent of inland water resources of India prevailed hovering potential considering aquaculture-entrepreneurship development. In fisheries sector the input production and the input-delivery-systems like fish production, marketing and exports, processing and product developments needs emerging entrepreneurs. The professionals in the government sector cannot take up all the responsibilities in order to bring quantum change in the system. There exists a variety of initiatives around the globe by the individuals and institutions, involving in missions of philanthropic nature, which try to create viable and sustainable changes in person's lives. Social entrepreneurship will be demanded to replace the existing aquaculture practices of India with more sustainable resilient practices and management strategy. This is one of the major lacunae of entrepreneurship development in fisheries sector. But according to Kahan (2012), farmers see their farms as a business and as a means of earning profit and thereby ultimately to bring about development. It would be pertinent to have a look into the scope and opportunities of fish based enterprises for livelihood security of fisherfolk in the chain of development.

The word development means the upliftment in the standard of living of the poorest of the poor in the society. Development of Indian fisheries sector in a broader visualization will be materialised with poverty eradication programmes though the transparent media namely Self Help Groups. Self

Help Groups can play a vital role for the fisheries sector development. The utmost important requisite for this is ensuring participation of fisherfolk especially women in the planning and implementation of various coastal sector development programmes. Alternative livelihood options through appropriate and economically viable micro enterprises are the only solution for meeting the ever-increasing demand of population in coastal belt in the context of diminishing per capita fish catch. The means of livelihood of coastal fisherfolk in different maritime states vary from one another. Since the livelihood conditions and technological requirements of the fishing population have not been studied in depth, it is difficult for any technological intervention and implementing other management options for improving the livelihood status of the fisherfolk. An attempt is made for developing a theoretical framework based on the review of past research studies related to livelihood analysis both at national and international level.

### **A couple of reviews in the National Level:**

Livelihood analysis indicates the way in which the farmers belonging different category of wealth make their livelihood including the crisis management. (Sabarathnam 2000) Viswanathan *et al* (2002) informed that fisheries in developing countries are under intense pressure from increasing coastal populations, over exploitation of resources and conflicts over access to degraded livelihood resources. This is one of the techniques of Participatory Rural Appraisal (Bhat,2003) for an expeditious analysis of the rural situation to plan and act. Livelihood analysis of coastal fisherfolk in any region is inevitable for the appropriate micro enterprise selection for the location for empowerment. (Kurien, 2003). Similarly several micro and macro level socioeconomic studies had been conducted by various agencies and research workers in different regions of our country on the livelihood problems of fisherfolk. (Srinath 1987; Sathiadhas and Panikkar,1988; Aujimangkul *et al*, 2000). The generalized objectives of such socio-economic studies stress on the assessment of human resources of identified geographical location, features of the target groups of specific developmental programmes, poverty, hunger, mal-nutrition and health status of fisher households, impact of introduction of new technologies and practices on income and employment, alternate fishing strategies and mariculture practices, infrastructure facilities and potential for development, rural indebtedness and supply of credit by various agencies, inter and intra structural conflicts in harvesting and post harvesting activities of marine fisheries, role of women in small scale fisheries sector, feedback information from the field to revise the strategy or devise to follow up action etc. Gender based studies and impact microfinance and SHGs also gained significance to a great extent in the present topic of discussion. (Vipinkumar *et al*, 2013)

### **A short glimpse of reviews in the International Level**

Livelihoods are attracting increasing attention in the context of Community Based Coastal Resource Management (CBCRM). The livelihood analysis encompasses all the strategies and assets that individuals and households use to earn a living (DFID, 2001; CBCRM Resource Center, 2003; Graham and Tanyang, 2001; Arciaga *et al*, 2002; Ashby, 2003). This definition is extremely broad, and its implications and local understanding of the term can only be understood through context specific participatory research and dialogue. There are three specific areas where livelihoods connect directly with CBCRM initiatives and all have relevance. First of all, from a livelihoods perspective, natural resource use by an individual or a group of people is part of their livelihood strategy. "A reversal of environmental degradation require new livelihood options that change people's incentives, in particular the benefits and costs of resource use" (Ashby, 2003; p2). Many livelihoods in coastal communities are based on the sea, therefore resource management activities, such as those commonly carried out through CBCRM initiatives, are livelihoods activities that reduce local vulnerability and enhance natural capital (Graham and Tanyang, 2001; Arciaga *et al*, 2002, Vipinkumar *et al*, 2015, 2017).

### **Some general observations in Fisheries sector**

Generally in fisheries sector, because of the lack of saving tendency, whatever the fisherfolk earn are being spent. Nothing is generally left for tomorrow. Entire family may starve unless he goes for fishing. While becoming sick, they may depend on private moneylenders for sustenance, food and medicine. If he falls in the trap of huge interest, the major portion of his earnings will be for paying interests. If the repayment is obstructed, the interest amount will grow bigger than the amount borrowed. The debt may transfer to the subsequent generations also. The formal financial organisations and banks are even at present unapproachable to these poor fisherfolk. It is not due to lack of interest that the fisherfolk don't save anything, but it is the lack of opportunity to save, which becomes the major obstacle preventing them from saving something. Even if they are interested in savings, there are a lot of obstacles to deposit in banks. For opening an account, another person possessing account in the bank has to introduce. Photographs and identity documents are required. Similarly, he has to remit a fixed amount to open an account. In addition to this, he has to forgo / sacrifice one day's labour for this purpose. Here comes the relevance of Self Help Groups.

### **Relevance of Community Cohesion and Self Help Groups**

There are a couple of differences between savings and thrift. Savings is the balance amount from expenses out of total earnings. But for the poor

income groups, expenses are more than earnings. Therefore, savings will be meager. Thrift is just like an item of expenditure compulsorily kept aside for future use and is not the balance from earnings. This is strictly kept apart. In olden era, a handful of rice kept apart every day when gets accumulated was being used during off seasons for sustenance. Thrift is just like that. A few women fisherfolk when mobilized as a group, members can contribute the fixed nominal amount as thrift in every week in the group meetings. This collective amount can be deposited in banks as joint account the very next day. Slowly this thrift amount gets grown to a considerably big amount Say for example, 25 members in an SHG when collect Rs 20/- each every week as thrift, it becomes Rs 500/- in the first week. It will be Rs 2,000/- in the first month and Rs 12,000/- within 6 months. As the thrift collection regulates the judicious spending habit among members, economic discipline in the SHG will be easily feasible. After 6 months of initiating the thrift collection, the members for the Self Help Groups can be given loan for their emergency expenditure at a nominal interest rate. The members themselves can decide the norms for the credit. Since the SHG members are known to each other, the needs can be prioritized as per their importance / significance and it meets the essential requirements of the members throughout 24 hours just like an informal bank in front of their house. The members will decide the duration of loans and interest particulars. By solving the problems of the SHG members on group basis the skills and ability of the members in handling financial matters get enhanced and the group slowly gets led to Self Helping Stage.

For undertaking some income generation activities for the members, a suitable micro enterprise is to be found out for the Self Help Group and then SHG can be linked to other financial organizations like NABARD, *Rashtriya Mahila Ghosh*, other banks etc for availing better credit facilities. The savings of the SHG when gets deposited in formal banks, there commences the relationship with the financial organizations. Since the welfare of the SHG naturally becomes the responsibility of the banks also, they actively involve in further activities, growth and progress of the SHG. Banks give loan assistance without supporting documents to SHG and in turn the SHG gives it to the members.

An SHG which functions as thrift-credit group for a minimum period of 6 months, can avail double of the thrift amount as loan from well-established financial institutions, The increase in thrift amount and punctuality in repaying the loans make these SHGs' deserve multiple times of thrift amount as loan further based on the norms of the institution. There are a lot of other financial organizations giving loans to SHGs'. Experiences and observations indicate that, for a group to be developed as a Self Help

Group, normally a period of 36 months (3 years) will be required. Within this gestation period when the group passes through three distinct phases, up to 4 months as the Formation Phase, up to 15 months as Stabilisation Phase, and up to 36 months as the Self Helping Phase, the group gets led to the stage of a flourishing Self Help Group as per the indications given by social research results on Self Help Groups. The fisheries Self Help Groups have to focus attention on joint efforts co-operatively for finding out suitable micro enterprises, which can assure a constant income for the fisherfolk, based on locally available resources for poverty eradication.

### **What is a micro enterprise?**

A micro enterprise is an activity which requires less capital, less manpower, local raw materials and local market. It is an individual enterprise whether known or unknown. (Vedachalam,1998). In fisheries sector, for the upliftment of fisherfolk below the poverty line, some successful micro enterprises developed based on the location specific resource availability and experience and some alternate avocations and subsidiary entrepreneurial ventures successfully being undertaken by Self Help Groups in coastal sectors and allied areas as follows:

Value added fish producing units, Dry fish unit, Fish Processing unit, Ready to eat fish products, ready to cook fish products, Ornamental fish culture, Mussel culture, Edible oyster culture, Clam collection etc. are very important. In agricultural sector, Vegetable cultivation, Ornamental gardening, Floriculture, Kitchen Garden, Orchards, Fruit products, Fruit processing, Sericulture, Mushroom cultivation, Medicinal Plants, Vermi compost, Snacks units, Catering Units, Bakery Units, Cereal Pulverizing units are some micro enterprises undertaken by Self Help Groups.

Based on the resource availability and circumstances the micro enterprises those the SHGs' can generally bring to practical utility in allied sectors are Wood work units, Stone work units, Soap units, Garment units, Computer centre, Poultry centre, Cattle rearing, Piggery unit, Bee Units, Stitching units, Hand Weaving Units, Candles, Chalks, Umbrella units, Foam Bed Units, Bamboo based handicrafts, Paper cover, Scrape selling, Vegetable seeds, Marriage bureau, Medicine collection, Patients service, Real estate, Medicine processing, Direct marketing, Coir Brush, Plastic weaving, Second sails, Meat *masala*, *Rasam* powder, Curry powder, Pickle powder, *Sambar* powder, Consumer service centres, Home delivery package, Repacking business, Cleaning powder, Phenol lotion, Liquid soap, Washing soap, Toilet soap, Kids' garments, Toffee & Sweets, Photostat, Washing powder of best quality and medium type, Emery powder, Domestic animals, Nursery plants, Note book, Book binding, Rubber slipper production, Pillow

cushion, Incense stick production, Cloth whiteners, Eucalyptus oil, Dolls, Hand shampoo, Soap shampoo, detergent shampoo, Jackfruit jam, Chips, Hotel, Catering service, Grape wine, Pineapple wine, Soft drinks, Chicken farming, Dried mango wafer, Dried chilli, Gooseberry wine, Ginger wine, *Pappads*, Tomato sauce, Day care centre, Coconut water vinegar, Syrups, Artificial vinegar, Mixed fruit jam, Milk chocolate, Tomato squash, Gum production, Cleaning lotion, Soft drink shop, Reading room, Private tuition, Counseling-guidance, Rent sales, Paying Guest service, Repairing centre and handicrafts are some of the employment opportunities that the SHGs' can venture throughout Kerala depending on the suitability of situations and availability of resources.

The suitability of the enterprise varies from situation to situation. The essential features for the success of a viable micro enterprise are :

1. The availability of sufficient quantity of raw materials locally.
2. The identified enterprise is known or easy to learn and practice.
3. The cost of production must be low.
4. The products must be of very good quality.
5. The availability of market for the products.

The important financial organizations giving financial assistance to SHGs' are Khadi Village Industries Board, Department of Commerce & Industry, *Jawahar Rosgar Yojana*, Women Industrial Cooperative Societies, Kerala State Social Welfare Advisory Board, Kerala Financial Corporation, National bank of Agriculture and Rural Development, District Rural Development Agency, Other Non Government Organizations, *Kudumbasree ayalkoottam* groups etc.

A case study undertaken on preference of fisherfolk by ranking of priorities for some selected viable micro enterprises in fisheries, agricultural and allied sectors in Milkatkar and Navgav locations of Alibag district in Maharashtra are presented Table 1. Technology status and technology needs were prioritized and ranking of priorities based on the Rank Based Quotient (RBQ) on fishery based micro enterprises was in the order as Preparation of value added products, fish processing, dry fish products, mussel culture, ready to eat & ready to cook fish products, ornamental fish culture, and edible oyster culture. With regard to Agriculture based micro enterprises the ranking was in the order of Kitchen garden, Vegetable Cultivation, Planting mangroves and acacia trees, Catering units, Cereal Pulverizing units, Ornamental Gardening enterprise etc. With regard to allied sector micro enterprises, the ranking was in the order of Cattle unit, Poultry unit, Bamboo based handicrafts, Wood – Stone carpentry, Computer centre, Candle unit, Chalk Unit, Umbrella Unit etc.

**Table 1: Ranking for priorities of women fisherfolk for the technology needs/ micro enterprises in fisheries sector based on the suitability of location**

No	Fishery based micro enterprise	Rank
1.	Preparation of Value Added products in Fisheries	I
2.	Preparation of Dry Fish products	III
3.	Fish Processing Unit	II
4.	Ready to eat fish products	V
5.	Ready to cook fish products	VI
6.	Ornamental Fish culture enterprise	VII
7.	Mussel culture	IV
8.	Clam collection	IX
9.	Edible oyster culture	VIII
10.	Pearl culture	XII
11.	Mud Crab culture	XI
12.	Any other	-
<b>Agriculture based micro enterprise</b>		
1.	Vegetable cultivation	II
2.	Ornamental Gardening enterprise	VI
3.	Floriculture	VII
4.	Kitchen garden	I
5.	Orchards	XII
6.	Fruit products	VIII
7.	Fruit Processing	X
8.	Snacks bar	IX
9.	Catering Unit	IV
10.	Bakery Unit	XI
11.	Cereal Pulverizing Unit	V
12.	Sericulture Unit	XIII
13.	Any other : Planting mangroves & acacia trees	III
<b>Allied sector micro enterprises</b>		
1.	Soap unit	X
2.	Clothes unit	XI
3.	Garments	XII
4.	Wood – Stone carpentry	IV
5.	Computer centre	V
6.	Cattle unit	I
7.	Poultry unit	II
8.	Hand weaving	XIII

9.	Candle unit	VI
10.	Chalk Unit	VII
11.	Umbrella Unit	VIII
12.	Foam Bed Unit	IX
13.	Bamboo based handicrafts	III
14.	Firewood	XIV

Certain important facts will be revealed as the consequences of Coastal Zone Development when gets practically materialized through SHGs'.

- Since the empowered SHGs' assist the members by undertaking thrift-credit activities through own savings and loans from banks through suitable micro enterprises, they adequately earn and make the members capable to stand in their own legs.
- Since the problems faced by the members are being presented and resolved on consensus every week, in the SHG meetings, they become able to exist with extreme protection feeling and mental health built by wholeheartedness developed through this coordination.
- Women's savings have a profound influence on the family safety and set up. The self-confidence that they can also work for the welfare of their family can be built up through these Self Help Groups.
- Since the SHGs' meet every week, all the members get a very good grasp about the beneficiaries in the respective locality and thereby making the election process of beneficiaries very transparent.
- The beneficiaries can be persuaded to utilize the eligible benefits for the purposes for which those were intended.
- Self Help Groups created a remarkable change in the social responsibility feelings for the fisherfolk. The incidents in which certain women SHGs' significantly contributed to the disaster relief funds are the clear-cut examples of the transformations created by economic empowerment.
- Irrespective of the political / religious restrictions, the ways by which Self Help Groups started taking lead role in cultural activities like celebrating special days, organizing common action programmes with involvement of cultural leaders, conducting arts and games competitions and literacy classes etc. are the examples of social responsibilities of Self Help Groups.
- These SHGs' as the symbol of 'collective cooperation' can function as an informal bank in front of home, a genuine friend in emergencies, a protector from exorbitant interest for loans etc.
- Based on the thrift deposits generated by an SHG, constituted with exact norms and standards, clear cut rules and regulations, the fisherfolk can come forward to identify suitable income deriving micro

enterprises with the effective utilization of loans available from banks and other financial institutions and thereby escape from the 'permanent debt trap' for ever.

From the light of experiences, it can be stated undoubtedly that, by solving common problems of coastal sector such as literacy, drinking water, lack of health and sanitation, housing/ shelter with extreme cooperation and commitment, the fisherfolk can improve the 'local economy' of the SHG and progress towards prosperity through empowerment of SHGs' based on participation.

### **Impact on Gender & SHG based fishery enterprises for livelihood security in Coastal India**

Similarly in another research study on Gender mainstreaming and impact of SHGs emphasized on selected 750 'Self Help Groups' in Gender mainstreaming in marine fisheries sector, an assessment of the level of performance and extent of empowerment through appropriate indices of measurement from 25 nos. of fishery based micro enterprises from Kerala, Karnataka, Tamil Nadu, Andhra Pradesh and Odisha was undertaken. In this study, identified the relevant fishery based and allied sector micro enterprises catering to the location specific needs of the SHG members and imparted 45 Entrepreneurial Capacity Building (ECB) Training programmes on the identified micro enterprises by appropriate HRD intervention programmes and organized 120 fisherfolk interaction meets. Data were gathered with standardized protocols, scales and indices developed in Mararikkulam, Thannermukkam, Kumarakom, Vadakkekara, Vallikkunnu and Kasaba in Kerala, Bengare, Surathkal and Ullala villages of Dakshina Kannada district in Karnataka and Pampan, Rameswaram, Thankachimadam and Mandapam locations in Tamil Nadu and Arakuda and Astaranga villages in Puri district of Odisha for standardization. In Andhra Pradesh, farmer interaction meets and video documentation were conducted for women SHGs of Bandarvanipetta of Sreekakulam district, Chinthappaly of Vijayanagaram district and Pudimadakka, Lawson's bay and Jalaripetta of Visakhapatnam district assessed the impact of SHGs. Documented 200 success cases on ECB of SHGs with special reference to gender perspective. Brought out 20 movies as Gender Mainstreaming series on Impact of SHGs, (Table 2) one book on, Gender Mainstreaming and Impact of SHGs in Marine Fisheries Sector and one Interactive Multimedia on Gender Mainstreaming and SHGs: A cyber extension package.

Whatever the enterprise may be, the selection or identification of the fishery based micro enterprise is the crucial and major deciding factor according to the technical viability and economic feasibility. It varies from time

to time, from place to place, from situation to situation and from occasion to occasion.

**Table 2: Fishery based Enterprises and details of SHGs covered**

<b>Sl. No</b>	<b>Enterprise</b>	<b>Number of SHGs</b>	<b>Avg. Level of Performance</b>	<b>Avg. Empowerment Index</b>
1	Fertifish unit	15	72.75	0.82
2	Chinese dip net	10	79.16	0.89
3	Aqua-tourism	8	78.92	0.88
4	Fish Aggregating Devices	10	79.95	0.89
5	Hand picking fishing unit	15	50.11	0.65
6	Clam processing	75	56.33	0.67
7	Pickling unit	75	72.26	0.83
8	Fish drying	60	69.95	0.78
9	Dry fish & fresh fish procuring	45	79.53	0.87
10	Fish vending /selling	70	69.16	0.78
11	Mussel culture	50	75.95	0.84
12	Prawn culture	30	59.61	0.69
13	Quarry fish culture	16	78.75	0.89
14	Cage farming	27	72.23	0.82
15	Ornamental fish culture	49	63.5	0.74
16	Fish culture	30	65.5	0.76
17	Paddy cum fish culture	30	74.91	0.83
18	Seaweed farming	30	77.63	0.86
19	Fish Amino units	10	75.35	0.84
20	Ready to Eat Fish Products	15	74.36	0.83
21	Ready to Cook Fish Products	20	71.35	0.81
22	Crab Processing	15	68.34	0.77

23	Aquaponics	5	70.21	0.61
24	Bivalve collection	30	69.16	0.77
25	Fish feed production	10	59.25	0.61

The economic feasibility analysis of these enterprises representing the indicative economics such as profitability, B:C ratio, Market Potential, Break Even Point, Pay Back Period etc. have been worked out through Business Plans developed under the project and these business plans can be used as a practical manual for implementing the appropriate fishery microenterprise based on the scope and opportunities. (Vipinkumar *et al*, 2017). This paper is a pertinent effort to make an overview of some viable micro enterprises through community participation and Self Help Group mobilization for rural livelihood enhancement, particularly in the fisheries sector and an analysis of livelihood options of fisherfolk. Paper also focuses on rural mobilisation through Self Help Groups as an inevitable requisite for poverty eradication in a developing country like India. How a meticulously mobilized SHG with an appropriate micro enterprise in fisheries, agricultural or allied sectors can progress towards prosperity within a short span of time is also depicted. A study undertaken on livelihood analysis showed the priorities on fishery based, agri-based and allied sector based micro enterprises based on the preferential ranking as per suitability. These prioritized micro-enterprises identified based on the suitability of the SHG through livelihood analysis in turn can bring about a desirable impact on technological empowerment in the coastal fisheries sector to a great extent.

## References

- Arciaga, Orlando, Fernando Gervacio, Robert Charles Capistraco and Cathrine Demesa. 2002. *Envisioning Life : Community – created Sustainable Livelihood Analysis and Development*. Philippines : Hribon Foundation & International Development Research Centre. 62 p.
- Ashby Jacqui. 2003. Introduction : Uniting Science and Participation in the process of Innovation- Research for Development. In managing Natural Resources for Sustainable Livelihoods- Uniting Science and Participation, IDRC, Ottawa, 252 p.
- Aujimangkul, S, Namasonthi, A., Jindanon, A and Wongsanga, P. 2000. Participation of fishermen in the seasonal closure: Measures for marine fishery resources conservation: A case study in the western part of the Gulf of Thailand. Kasetsart University Fishery Research Bulletin No. 23 : 1-20

- Bhat,V.M.2003. Participatory Rural Appraisal In *Training Manual of Rubber Technology Officers*. Indian Agricultural Research Institute, Division of Agricultural Extension, New Delhi.
- CBCRM Resource Centre.2003. Sustainable Livelihoods Issues in CBCRM. Pp 32-34.In *Sustainable Livelihoods in Community Based Coastal Resource management Vol 2*, San Antonio, Zambales, Philippines.
- DFID.2001. Sustainable Livelihoods Guidance Sheets. DFID, London.
- Graham, Jennifer and Gaynor Tanyang. 2001. The Sustenance of Life: A Pilot Research Exploring SL in CBCRM, Tambuyog Development Centre and Coastal Resources Research Network, Dalhousie University.
- Kahan, D. 2012. Entrepreneurship in farming. *Food and agriculture organization*
- Kurien,John. 2003. The Blessing of the commons: Small –scale fisheries, community property rights and coastal natural assets. *Working paper 379*, CDS Trivandrum.
- NFDB, 2016. National Fisheries Development Board, (Online). Available at [nfdb.gov.in](http://nfdb.gov.in). Accessed on 2 october 2017
- Sabarathnam. V.E, 2000. Rapid Rural Appraisal and Participatory Rural Appraisal In *Training Manual on Foundation Course for ARS*, National Academy of Agricultural Research Management, Hyderabad.
- Sathiadhas. R and Panikkar,K.K.P. 1988. Socio-economics of small scale fishermen with emphasis on costs and earnings of traditional fishing units along Trivandrum coast, Kerala- A Case Study. *Sea food Export Journal*, 20 ( 2 ): 21-36.
- Srinath Krishna. 1987. Role of women in small scale Fishery - A Case Study, *Mar. Fish. Infor. Serv. T & E Ser.*, No. 74 : 13-16.
- Vedachalam,E. 1998. *Community Action for Rural Development ( CARD ) Micro – Enterprise is the Need of the Hour*. In *Micro – Enterprise Development – Potentials and Possibilities*. Asian Society for Entrepreneurship Education and Development (ASEED). New Delhi. Pp172-176.

- Viswanathan, K.K, Nielsen, J.R, Degnbol, P and M.Ahmed. 2002. Fisheries Co-management- Findings from a World Wide study: A Policy brief, World Fish Center, Penang, Malaysia
- Vipinkumar,V.P, Shyam,S.Salim, Narayanakumar,R, Sathiadhas,R, Madan,M.S, Ramachandran,C, Swathilekshmi,P.S and Johnson,B. 2013. *Coastal Rural Indebtedness and Impact of Microfinance in Marine Fisheries Sector*. Central Marine Fisheries Research Institute, Kochi.p 150.
- Vipinkumar,V.P, Asokan,P.K, Mohamed.K.S, Kripa,V, Sasikumar Geetha, Vidya,R and Athira, P.V.2015. *Gender perspective and effectiveness of group dynamics in women empowerment: a study on self help group initiative in mussel farming along the Malabar Coast, Southern India*. *Discovery*, 49 (226). pp. 1-27. ISSN 2278–5450.
- Vipinkumar VP, Narayanakumar R, Harshan NK, Sunil PV, Ann Mary Jephi, Athira PV, Ambrose TV, Jeethumol TJ. 2017. *Mainstreaming gender through Aquatourism venture: an assessment of impact of women SHGs in Kerala*. *Discovery Nature*, 11(26), 1-19
- Vipinkumar, V.P, Narayanakumar, R., Harshan, N.K., Jephi, A., Athira, P.V., Jeethumol, T.J. and Dilip, D. 2017. *Impact of Self Help Groups in Gender Mainstreaming: A Case Study on Fish Amino Enterprise in Vypin, Kerala*, *Int. J. Pure App. Biosci.* 5(6): 337-345, doi: <http://dx.doi.org/10.18782/2320-7051.6003>
- Vipinkumar, V.P, Narayanakumar, R., Johnson.B, Swathilekshmi.P.S, Ramachandran.C, Shyam.S. Salim, Reeta Jayasankar, Shinoj.S and Aswathy.N. 2017. *Gender Mainstreaming and Impact of Self Help Groups in Marine Fisheries Sector*, Project Report,

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