



Marine Fisheries; Its Current Status, Sustainable Management and Socio-Economic Status of the Marine Fishers of Odisha, Through Indian Marine Policy: A Case Study

Singh Tarun Kumar¹ and Patnaik Shivani²

¹Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture, Government of India, New Delhi, INDIA

²Chilika Development Authority, Bhubaneswar, Odisha, INDIA

Available online at: www.isca.in, www.isca.me

Received 2nd June 2014, revised 26th June 2014, accepted 20th July 2014

Abstract

While we talk about inclusive growth globally and equality among unequals, the actual methods and the procedures which are being adopted for implementing these thoughts differ globally in terms of policies and planning of different regions. If we consider fishery as an industry, fishermen essentially constitute the primary stakeholder group. The services rendered by fishers to the fishing sector are the basic platform for the prospective growth of the fishing industry substantially. Sharing the acquired experience and their unique efforts in providing night time labour, source of traditional know-how related to fish and fishery, are extremely important for its sustainability. Without inclusive growth and improvement in their socio-economics, the growth of the fishing industry shall not be at the desired level. Disparity in living standard, unequal access to monetary income and lack of basic amenities would lead to discontent among fishers as a result of which their motivation level to participate in fishing activities may fall down. Appropriate design and implementation of developmental programmes are the key to improve the socio-economic condition of the fishing community. This article highlights the status of marine fisheries in Odisha especially analysing the socio-economics of marine fishers with special reference to the targeted policies of the Governments.

Keywords: Inclusive growth, chilika lake, ramsar site, dahikhia, brahmagiri, global warming, below poverty line, letter of permission, EEZ, union government, Kutcha houses, Pucca houses, interactive governance.

Introduction

Human evolution and human history speak that fish has been one of the major sources of food and to get this food; fishing activity was undertaken from oceans, lakes and rivers. Although ocean productivity is unlimited and renewable, with increased human knowledge on nature and its resources, and the dynamic technology developed by human being to exploit these resources, the renewable living aquatic resources appear to be exhaustible^{1,2}. The livelihoods and way of life of fishing communities globally are threatened as they struggle to cope up with dwindling fish stocks and the increasing regulatory regime³. Overfishing is a major problem in global fisheries, plaguing 32% of stocks around the world and a massive 72% in the EU⁴. The present scenario of global warming and climate change has brought up fishing sector under its ambit. Stock depletion and less recruitment have negative implications for food security particularly major threat to the economy and well-being of coastal communities, food security, job opportunities, income and livelihoods as well as traditional cultural identity and especially to those relying on fish as their main source of animal protein and income^{1,5}. The global marine fish production was 80 million tonnes in 2009 and was directly giving employment to 34 million people in fishing operations. Besides, marine fish supplied to more than 3 billion people with at least

15% of their average animal protein intake in 2008^{3,5}. Therefore, to maintain the long-term prosperity and sustainability of marine fisheries, promotion of responsible fisheries will help to ensure that fisheries resources will continue to provide realistic support and benefits for both present and future generations⁵⁻⁷. The United Nations Convention on the Law of the Sea (UNCLOS), the United Nations Fish Stocks Agreement (UNFSA [UN, 1995]) and the FAO Code of Conduct for Responsible Fisheries (FAO, 1995a) are few instruments focusing on restoring fish stocks at levels that are capable of producing their maximum sustainable yield (MSY). To achieve the above objectives fishery management and development authorities would have to undertake assessment of the state of fish stocks and develop effective policies and management strategies^{2,3,5,6}. After independence, Government of India started working on development of fisheries with major objectives to increase the fish production which would be used as weapon against malnutrition vis-à-vis to improve the socio-economics of the fishermen community. In order to provide scientific base for long term development, the Union Government of India started setting up of Fisheries Research Institutes for scientific up-gradation of fishing. Besides, Government of India planned and implemented different schemes under different policies in this regard^{6,7}.

Odisha: A provincial State of India: In Odisha, the fisheries development was carried out by the Industries Department and was subsequently taken up by Fisheries Department^{8,9}. The name ‘Odisha’ formerly known as ‘Orissa’ is derived from the Sanskrit ‘Odra Vishaya’ or ‘Odra Desa’. Odisha is one of the important maritime provincial States of India extends from 17⁰49’ N to 22⁰54’ N latitude and from 81⁰29’ E to 87⁰29’ E on the Eastern Coast of India. It has an area of about 155,707 km² and is bounded by other provincial States such as West Bengal in the north east, Jharkhand in the north, Chhattisgarh in the west and Andhra Pradesh in the south. Besides, the Bay of Bengal spreads in the eastern part of Odisha. Odisha was considered as an independent provincial State on 1st April, 1936 by dividing the provincial State of Bihar (Jharkhand was within Bihar) with capital at the historic city of Cuttack. In 1956, the capital was shifted to Bhubaneswar, the City of Temple^{10, 11, 12}. It has a coastline 480 km with some spectacular virgin beaches, lake and lagoons. Six districts namely: Balasore, Bhadrak, Kendrapara, Jagatsingpur, Puri and Ganjam share the coastline. Among the major maritime States of India, Odisha stands 8th in marine fish production (figure 1)^{11,13}.

There is a common consensus between the natural fisheries scientist and the social scientist globally on the statement “viable fish stocks require viable fishing communities”^{14,16}. This means, fishers communities have to play effective role in co-management of fishing as well as socio-economics of their territory keeping sustainability in mind. The three dimensional concept for the social wellbeing brought by Britton and Coulthard (2013) is a realistic concept to understand the socio-economics and the need for implementation of policies for inclusive growth of the fishers communities¹⁷. This study although adapts the above stated 3D concept, it particularly tries to view the policies targeted to marine fishing sector passing through Government of India, Government of Odisha, targeting the fisher community⁷.

Fishery is a State Subject: If there is one book that one must read to comprehend, it is the “Constitution” of one’s own country, and if there is a principle that a government and a citizen should abide by, it is “Constitutionalism,” provided they both exist¹⁸. The Indian Constitution, under its Seventh Schedule, has divided the subject matter jurisdiction between its Union Government and the different provincial State Governments by classifying three lists. “Union List” (exclusive jurisdiction of Union Govt.), “State List” (exclusive jurisdiction

of provincial State Govt.) and the “Concurrent List” (Union Govt. decision dominates the matter of jurisdiction)^{19,20}.

A legal backing is the most required document for any sector for proper management and regulation. As per the Article 246 of Constitution of India, the entry No. 21 of State List renders the powers to the provincial States to handle the subject matter of fisheries while the entry No.57 of Union list gives the power to the Union Government to handle the fishing and fisheries beyond territorial water. Besides, the Territorial Waters, Continental Shelf Exclusive Economic Zones and other Maritime Zone Acts, 1976 (80 of 1976) of India provides the Union Government sovereign rights for the purpose of exploitation, exploration, conservation and management of natural resources, both living and non-living as well as for producing energy from tides, winds and currents in exclusive economic zone beyond its territorial waters upto two hundred nautical miles which also includes fishing and fisheries^{20,21}.

Material and Methods

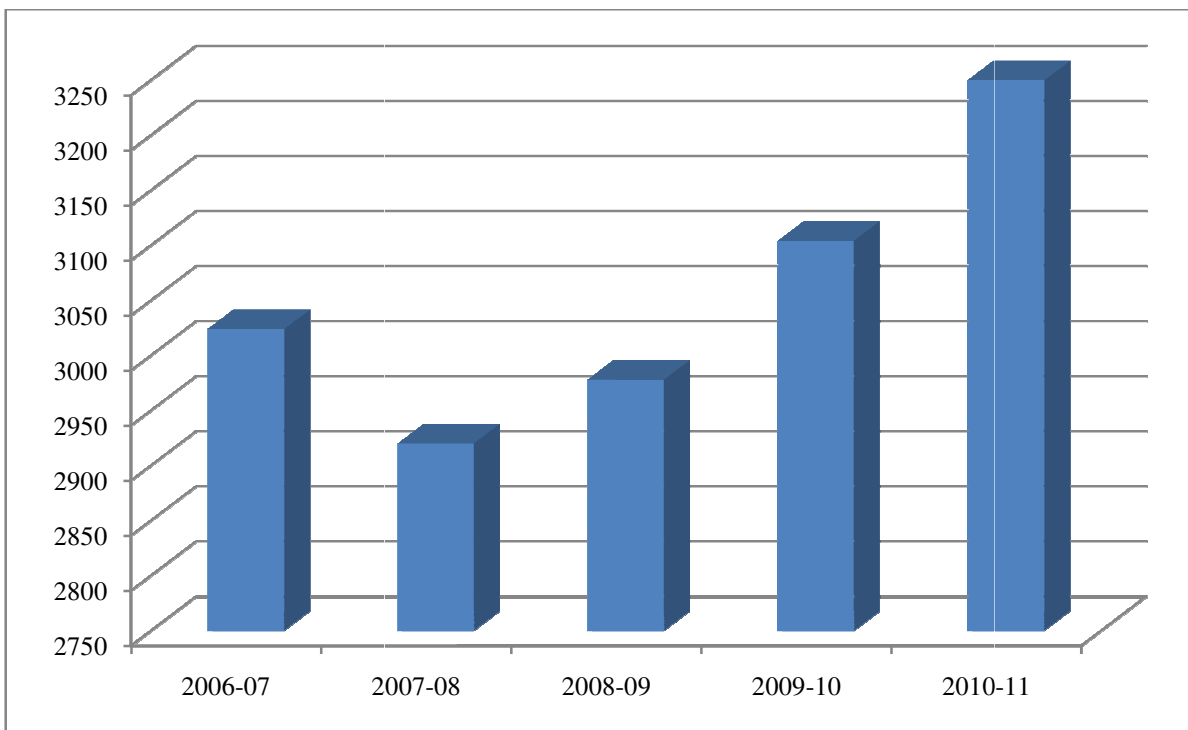
This article has been prepared mainly from the primary data collected and compiled by the Directorate of Fisheries, Government of Odisha and data from Marine Fisheries Census complied by Central Marine Fisheries Research Institute (CMFRI) on behalf of Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture, Union Government of India, and the Hand Book of Fisheries Statistics published by Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture, Government of India. Besides, the secondary data collected by referring various other publications¹⁴.

Marine Fish Production of India and Odisha: India is the second largest producer of fish in the world contributing 5.43% to the total global fish production. Indian aquaculture production stands second in the world after China. Fish being the chief source of protein for human nutrition and also a foreign exchange earner, the fisheries sector has an important role in the socioeconomic development of country especially as a source of livelihood for a large section of economically backward population of the country. The table-1 and followed by figures 1-3 are highlighting some fish production details of India and Odisha^{21,22}.

Table-1
Fish Production of India and the Average Annual Growth Rate (Per cent) (From 2006-07 to- 2010-11)

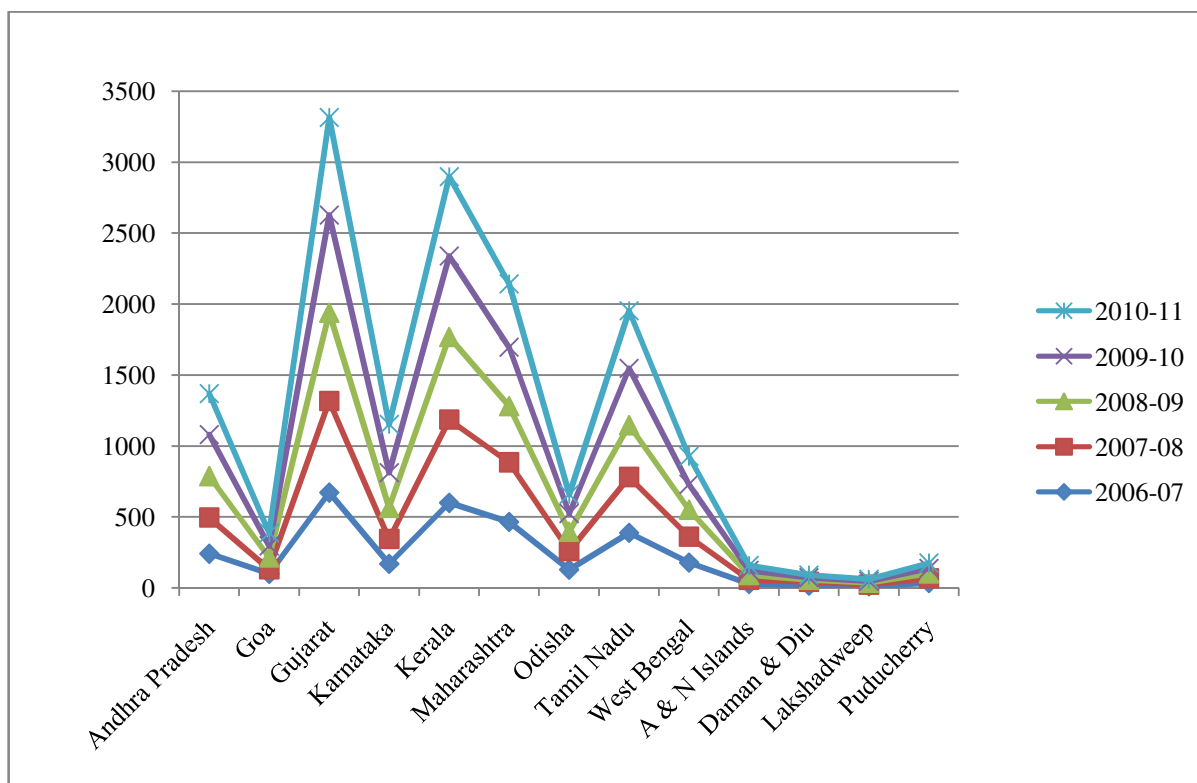
Year	Fish Production (‘000 tonnes)			Average Annual Growth Rate (Per cent)		
	Marine	Inland	Total	Marine	Inland	Total
2006-07	3024	3845	6869	7.30	2.37	4.52
2007-08	2920	4207	7127	-3.44	9.41	3.76
2008-09	2978	4638	7617	1.99	10.24	6.86
2009-10	3104	4894	7998	4.23	5.52	5.02
2010-11	3250	4981	8231	4.70	1.78	2.91

Source: Hand Book of Fisheries Statistics, 2011



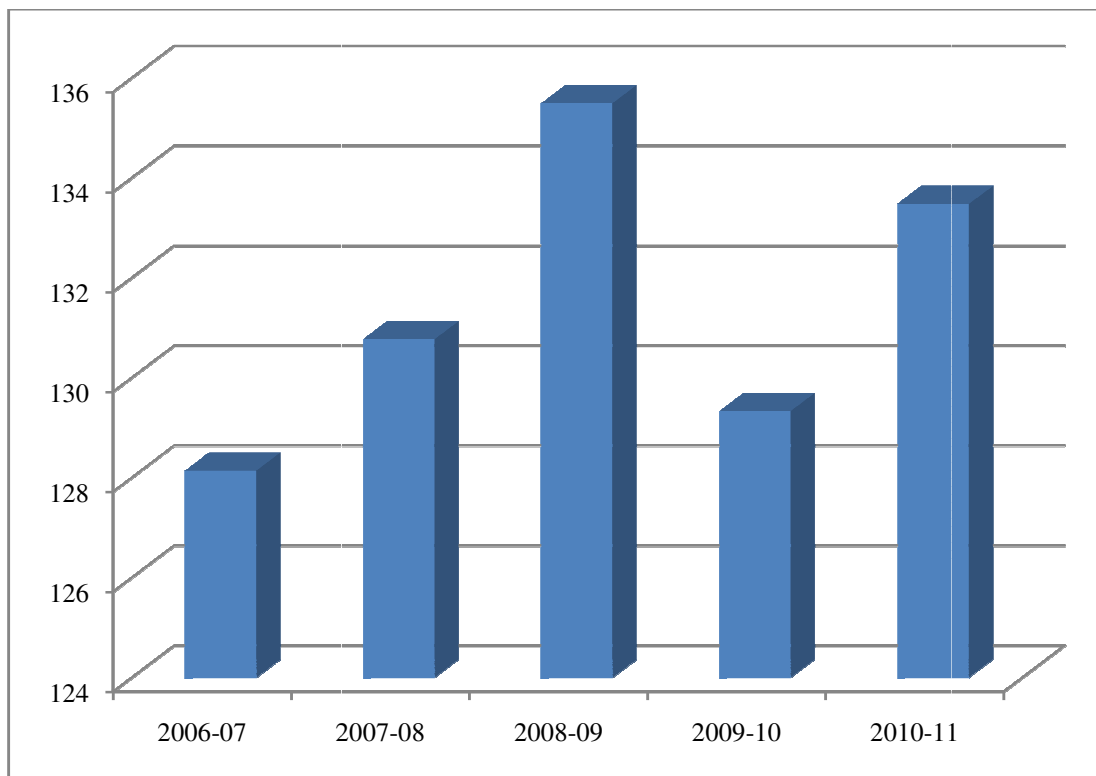
Source: Handbook of Fisheries Statistics, 2011

Figure-1
Marine Fishery Production by India during 2006-07 to 2010-11 (Quantity in '000 tonnes)



Source: Handbook of Fisheries Statistics, 2011

Figure-2
Showing Marine Fishery Production by States and UTs during 2006-07 to 2010-11(Quantity in '000 tonnes)



Source: Handbook of Fisheries Statistics, 2011

Figure-3
Marine Fishery Production of Odisha during 2006-07 to 2010-11 (Quantity in '000 tonnes)

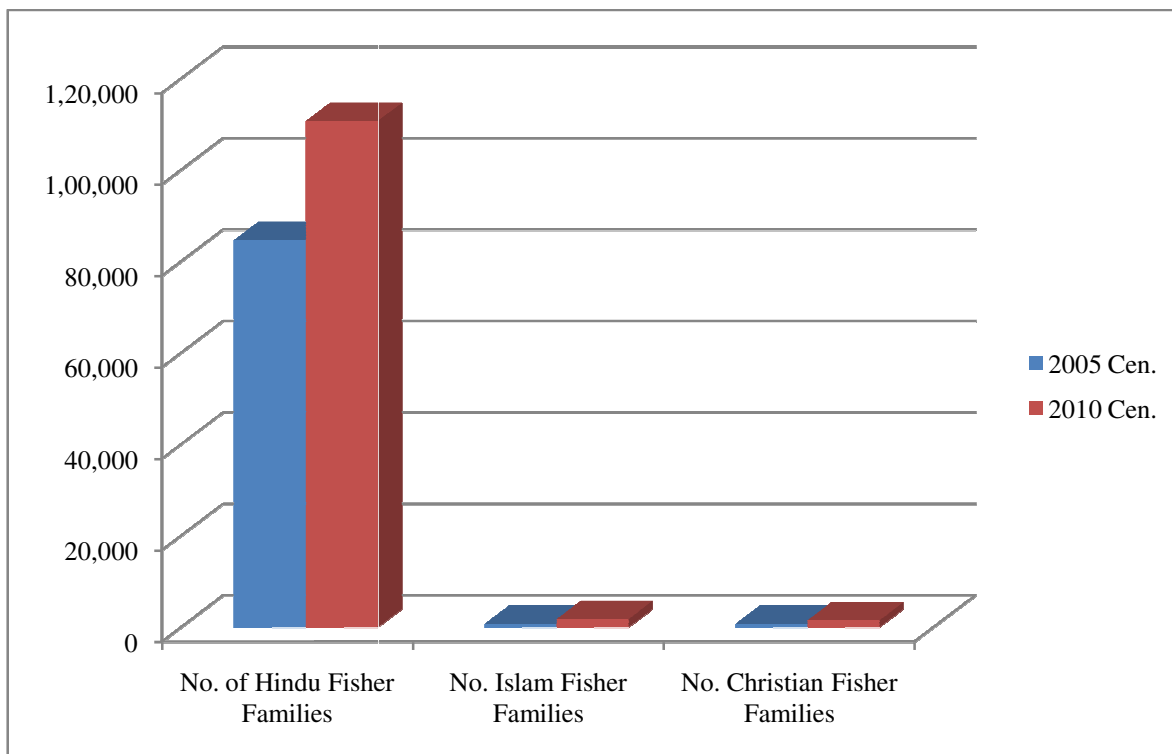


Figure-4
Showing Religion of Marine Fisherfolk of Odisha

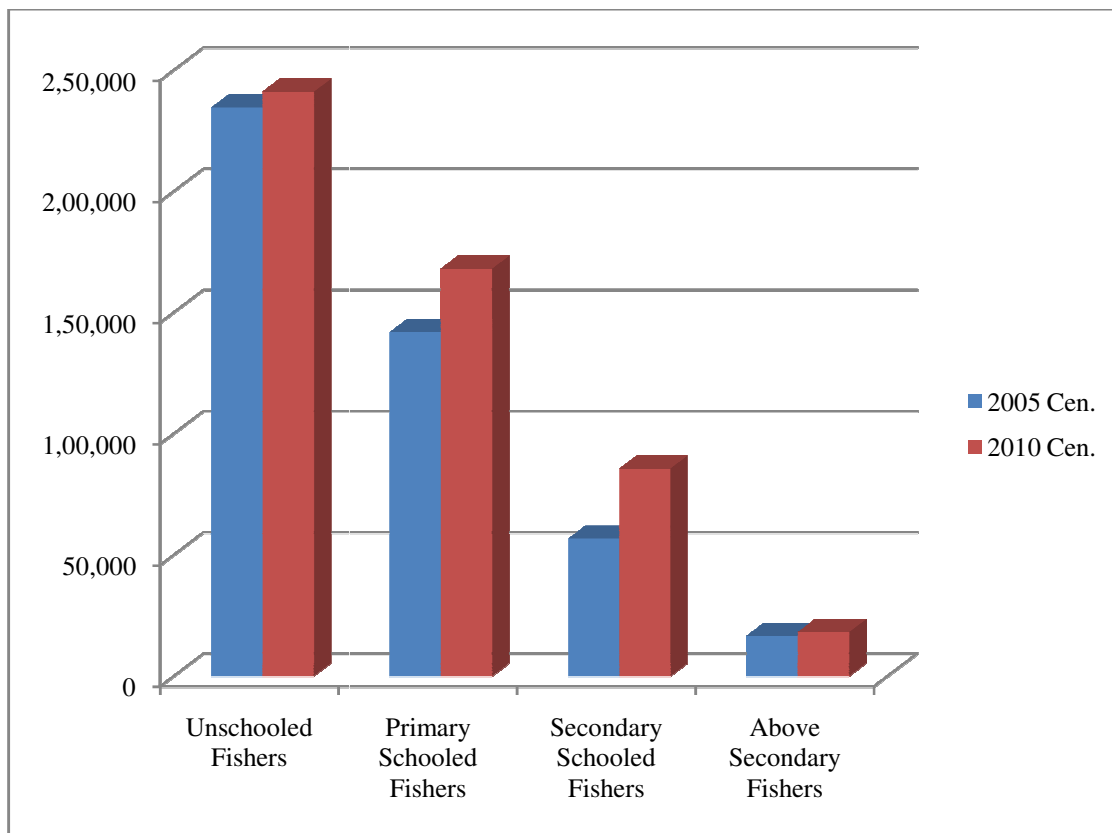


Figure-5
Showing Educational Status of Marine Fisherfolk of Odisha

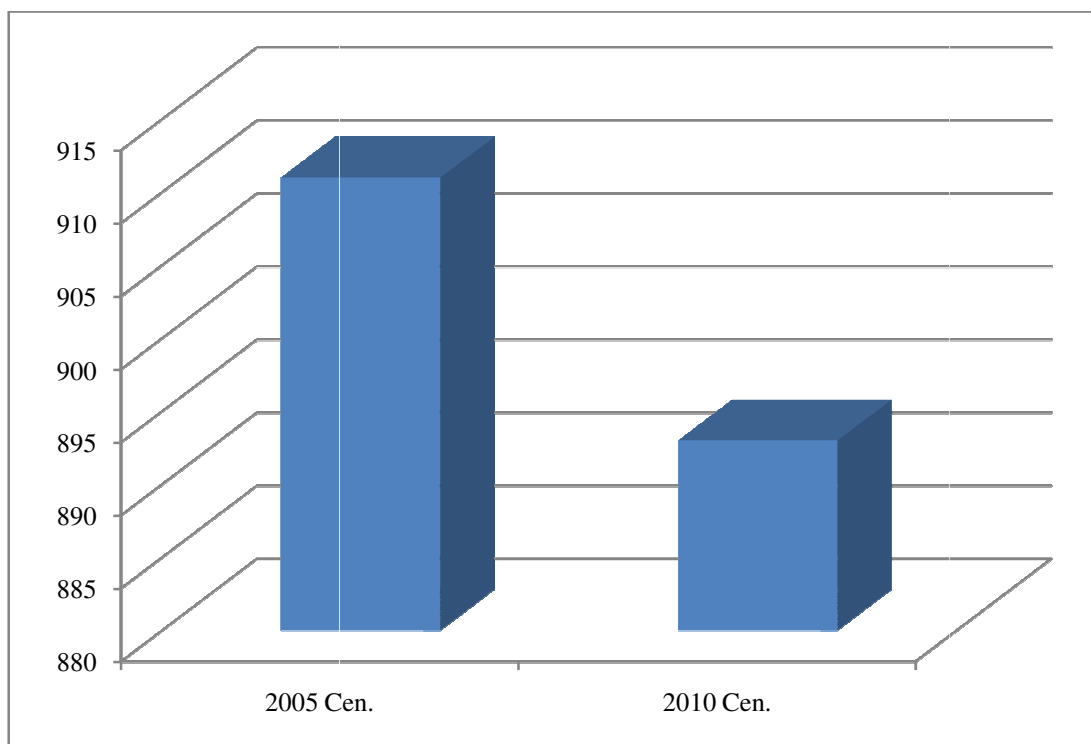


Figure-6
Sex Ratio (Number of females per 1000 males) of Marine Fisherfolk of Odisha as per Marine Census 2010 and 2005

Socio-economic Profile of Coastal Fishers of Odisha

Population: 3,288 numbers of marine fisher villages are in India, out of which 813 numbers (24.7%) are in Odisha, 573 numbers (17.4%) are in Tamil Nadu and 555 numbers (16.9%) are in Andhra Pradesh. Out of the 813 numbers of villages of Odisha, Balasore district has the highest (415 numbers of villages) and Ganjam district has the lowest (26 numbers of villages). Out of 1,511 marine fish landing centres of India, Tamil Nadu has the highest numbers *i.e.*, 405 (26.9%). In Odisha, the total numbers of landing centres are 73, out of which 20 belongs to Ganjam district. There are 864, 550 marine fishermen families in India, out of them, 789, 679 (91.3%) were traditional fish families. Tamil Nadu has the highest among all the States with 192, 697 numbers. Odisha has 1,14, 238 numbers of marine fishermen families (77% belong to traditional family) while among its all districts, Balasore districts has the highest numbers (47,162). The average number of families per village is 141, with 745 persons per village and the average family size is 5.3 (4.63 in India) with a minimum of 4.1 in Ganjam district and maximum in Balasore districts. In comparison to the marine fishermen population of India where 33.6% are adult male, 31.9% adult females, 12.7% male children and 11% female children above 5 years of age, Odisha has 31% adult male and 28% adult females and 41% are children. The female forms 47% of the population and the number female to 1000 male is 893. This ratio is highest in Bhadrak district (1000/919)^{22,23,24}.

Poverty, Education, Religion and Caste: It is observed that around 61% of the marine fishermen families (523, 691) are falling under Below Poverty Line (BPL) category in India, while in Odisha, it is nearly 49% (56, 279). Balasore district has the highest BPL families (49%) while Jagatsinghpur district has the lowest²³.

Out of the total Indian marine fisherfolk, 57.8% educated with different level of education comprising 30.9% males and 26.9% females. In Odisha, 53% of fisherfolk (excluding children below 5 years of old) are educated with different level of education^{22,23}.

India being a Secular country, its marine fishermen families are also diverse as far as religion is concerned. While Hindus constitute the major population among them with 75.47%, Christians and Muslims constitute 15.21% and 9.28% respectively. The pattern in Odisha is that 97% fishermen families are Hindus, 2% are Muslims and remaining 1% are Christians. The overall percentage of Schedule Castes (SC) and Schedule Tribes (ST) among the marine fishermen families is 16.6% in India. But it is as high as 59.3% in Odisha^{22,23}.

Occupation: 37.8% of the total marine fisher population are actively engaged in fishing activities (83.4% of them are fully engaged) while 2.4% are engaged in fish seed collection (54.4%

are fulltime engaged). As far as maritime States are concerned, Tamil Nadu accounted the highest number of active fishermen (21.6%) followed by Odisha (16.4%). 61.1% of the total marine fishers of India are engaged in fishing allied activities. Out of them 36.5% are engaged in marketing of fish, 32.6% are working as labourers and 14.2% are engaged in making and repairing of net. Among the fishermen who are engaged in marketing of fish, 81.8% are women. 88.1% of the fisherfolk engaged in curing and processing are women. 57.4% of fishermen engaged in fish seed collection are females and 42.6% are males. Maximum number of fishermen engaged in making and repairing net are in West Bengal (18, 419; 21.2%) followed by Odisha (17,871; 20.6%). Odisha is third among the maritime States where fishermen engaged in curing and processing with 8,492 persons (15.9%). Odisha is also the third State where maximum fisherfolk are engaged as labourer with 27,707 persons (13.9%). In Odisha, among 1,62,411 active fishermen, 99,972 are fulltime fishermen and 35, 609 part time while remaining are engaged in fish seed collection^{22,23}.

In India, 32% of the adult fishermen have memberships in co-operatives societies among which 22.1% are member of fisheries cooperatives and 9.9% are member of other cooperatives. While in Odisha, 14% of the adult fisherfolk are members in cooperative societies out of which 55% are in fisheries cooperatives societies^{22,23}.

Craft and Gear, and Infrastructure in Fishing Villages: In the marine fisheries sector of India, there are 194,490 numbers crafts. Out of these 72,559 numbers (37.3%) are mechanized, 71,313 numbers (36.7%) are motorized and 50, 618 numbers (26.0%) are non-motorized. It is also observed that 167,957 numbers of crafts are owned by fisherfolk. 52.6% of them are non-motorized, 24.2% are motorized and 23.1% are mechanized. From the mechanized crafts owned by fishermen, 28.9% are trawlers, 42.8% gillnetters and 19.1% dolnetters²⁴.

In this regard, in Odisha, the total crafts in fishery are 10,826 numbers. Out of these 2,248 numbers are mechanized and 3,922 numbers are motorized and remaining 4,656 numbers are non-motorized. Among the different types of crafts used in fishing mainly in mechanized sector in Odisha, 58% are trawlers, 35% are gillnetters, 5% are liners and 2% are bag netters. Out of the crafts operated in Odisha, 25,307 numbers of crafts owned by fisherfolk. 2861 numbers are mechanized, 3084 numbers are motorized and 19,362 numbers are non-motorized. Non-motorized plank built boats are accounted for 61% of the crafts owned by fisher folk followed by gillnetters (10%) and motorized plank built boat (5%). The important gears owned by the fishermen of Odisha are castnets, gillnets and driftnets. Gillnets and castnets are seen being operated in sharing pattern^{21,24}.

It is observed in the area where the fishermen communities are residing in Odisha that 76% of the fishermen houses are kutcha houses and 24% pucca houses. Besides, 810 primary schools,

255 secondary schools, 49 colleges and 31 technical institutions are in the fishing villages. 64% of fishing villages are electrified, 18% of the villages are having bus stop/bus stand and 89% villages had cellphone coverage. As surveyed, 56 ice factories, 22 boat yards, 39 curing yards, 28 peeling sheds, 14 cold storages and 2 freezing plants are there in Odisha^{16,17}.

Analysis and Assessment of Marine Policy

The Marine Policy: Indian Scenario: India has a coastline of 8118 kilometers (km) and an equal large area under estuaries, backwaters, lagoons etc., conducive for developing capture as well as culture fisheries. After declaration of the Exclusive Economic Zone (EEZ) in the year 1977, an area of 2.02 million km² (comprising 0.86 million km² on the west coast, 0.56 million km² on the east coast and 0.60 million km² around the Andaman and Nicobar Islands) including 0.5 million km² of continental shelf has come under the jurisdiction of the Republic of India. The coastline has been distributed among nine maritime States and other maritime Union Territories like Puducherry, Daman and Diu, Lakshadweep, and Andaman and Nicobar Islands. A significant contribution to the Indian national economy is shared by fisheries sector. The fisheries sector provides livelihood to an estimated 10 million people. This sector is diverse and the benefits of coastal ecosystem services are unequally distributed amongst different user groups. A large percentage of fishing households are at risk from growing poverty fuelled by ecosystem degradation, rapid coastal development, and climate change^{7,21,25}.

Looking at the vested role, the Ministry of Agriculture, Government of India has been paying due attention to the marine fisheries sector through different policies from time to time. The marine fisheries policies of India in the past had been focused only on the developmental front of deep-sea sector. Subsequently, the Union Government focused on the marine sector through policies with objectives: i. to augment marine fish production in sustainable and responsible manner so that the export from sea of the country should increase along with increase in per capita protein consumption, ii. to ensure socio-economic security to the artisanal fishermen whose livelihood solely depends on the indulge activities within this sector, iii. to ensure sustainable development of marine fisheries with due focus on ecological integrity and bio-diversity beside complying international obligations associated with the sector. Hence, the marine fisheries have been diversified into different components such as costal fisheries, marine fisheries resources, deep sea fishing, harvest and post-harvest of marine fisheries resources and the most important one is infrastructure for marine sectors^{7,13,25}.

As regards marine resources of India, the Fishery Survey of India (FSI) with its headquarters at Mumbai, a wing of Ministry of Agriculture, is responsible for survey and assessment of marine fishery resources in the Indian EEZ. It undertakes exploratory surveys for charting of fishing grounds, assessment

of fish stocks in the Indian EEZ including adjoining high seas resources. FSI also re-validates periodically the potential of fishery resources in Indian EEZ. It is given the responsibility to monitor fishery resources for the purpose of regulation and management, maintenance of Data Bank and dissemination of information on fishery resources^{7,26}.

The Union Government has planned a Central Sector Scheme on Strengthening of Database and Geographical Information System for the Fisheries Sector to improve the efficiency and quality of data as well as reduction in time lag in preparation and submission of survey vessels/reports. It also aims at estimate fish production of both inland and marine in all districts in the States and UTs and to provide a comprehensive data base to fishery sector so as to facilitate planning process both at the State and Central level^{7,25}.

Regarding the coastal fisheries, harvest and postharvest of marine fisheries resources and infrastructure for marine sectors, the Union Government has chalked out a Centrally Sponsored Scheme on Development of Marine Fisheries, Infrastructure and Postharvest Operations with the objectives to supplement the efforts of the State Governments and Union Territories for development of fishery sector. It aims at creation of infrastructure facilities for safe landing and berthing of fishing vessels lying along Indian coastline. In addition, it also aims at creation of infrastructure facilities for processing and preservation of fish quality thereby reducing postharvest losses. Reduction of the burden on the fishers by giving subsidises in the input cost on HSD to the fishers in BPL category and to increase safety of fishermen at sea are the provisions among others in the scheme. The scheme is largely intended to improve socio-economic conditions of primarily the marine fisher folk⁷.

The deep sea fishing was based on the different Charter Policies of Government of India. Now days, these polities are not valid. To regulate the vessel operation in the EEZ of India, Ministry of Agriculture issues Letter of Permits (LOPs) which follows the additional guidelines for such operation. Violation of these guidelines results into penalty and cancelation of LOP. These guidelines incorporate the international provisions of United Nation Convention on Law of Sea, 1982 and FAO's Code of Conduct for Responsible Fisheries (CCRF). In 2004, Government of India announced the Comprehensive Marine Policy. On the basis of this, an Inter-Ministerial Empowered Committee on Marine Fisheries was also constituted which examines the applications of import and operation of fishing vessels of more than 20 m overall length. The operation of fishing vessel imported and owned by Indian and operated by foreign crew members, falls under purview of different agencies and Ministry i.e., Ministry of External Affairs, Ministry of Defence, Ministry of Home Affairs, Ministry of Shipping, Ministry of Commerce, and Ministry of Agriculture etc. This is also governed under the Maritime Zone of India (Regulation of Fishing by Foreign Vessels) Act, 1981. This Act clearly states

about the rules and procedures to be adopted for operation of foreign vessel in Indian EEZ^{7, 13, 25-28}.

Marine Fishery Policy of Odisha: Like other provincial States, Odisha has its own Act to regulate marine fisheries within the 12 nautical miles from the coastlines called as Orissa Marine Fisheries Regulation Act, 1982. This Act has provisions of registration of fishing vessel which are intending for operation at Odisha coast. This Act regulates the marine fishing through its different provisions under this Act and also has clauses for penalizing any violation of the rules and regulation of the same. For the development of marine fisheries, Odisha Government implements different schemes planned by the State Government as well as the Centrally Sponsored Schemes related to marine fisheries^{8,9}.

Chilika Lake, the designated Ramsar Site in 1981, is one of the highly productive eco-system. It is one of the main sources of capture fisheries of Odisha and provides food and livelihood security to more than 0.2 million fisher folk. The fish and fisheries subject is looking after by the Chilika Development Authority (CDA) in collaboration with Directorate of Fisheries, Odisha. While the creation of CDA by the Forest and Environment Department, Government of Odisha, was for restoration and sustainable management of Chilika Lake with all its genetic diversity and conservation of nature and its resources, the activities like improvement of Nalabana Eco-system (notified Wildlife Sanctuary), fishery resource management, socio – economic development of fishers and the development of communication network including ferry services linking the island villages have boosted the socio-economics of the marine fishers of this region. There have been significant improvements of the lake fishery. To monitor the lake fishery, fish landing data is being collected from 24 fish landing centers, 2 island markets and one cluster of fish godowns from the eastern side of the Lake (Dahikhia to Brahmagiri) which are compiled every month^{8,10}.

WTO Negotiating Group on Rules and Indian Marine Policy: The ongoing discussion and deliberation in WTO Negotiating Group on Rules on fisheries subsidies is critical and important to many developing countries. This because, to many member countries, fisheries constitutes the main source of livelihood, employment, means of poverty alleviation, food security and also source of export earnings. While FAO has estimated that developing countries are responsible for about half of world production of fish, these countries are accounting a substantial share for fish exports by value and volume. Many developed countries, under the WTO regime, are demanding the grants given by Government of India under its marine fisheries schemes targeting infrastructure facilities especially for ports and harbours and the subsidies on HSD Oil would be falling under the Article 3 of WTO Agreement on Subsidies and Countervailing Measures (ASCM). Hence this may be categorised as Prohibited Subsidy. In this regard, along with India, many members feel that it would be worth considering on

a pragmatic basis whether a way could be found to impose and effective discipline on fuel subsidies to fisheries, without regard to whether they are specific or not^{7, 29, 30}.

India has been opposing such concept with due explanation and justification that many developed countries had been extending "diesel and gasoline excise tax exemption" to the fisheries sector since 1951 by treating "fishermen comparably to farmers in the provisions of a partial exemption from the motor fuel excise tax for fuel consumed in the course of business". It is reiterated by India that fisheries fetches a major source of income to the poor fishers, while giving food security in many manner with livelihood sustenance to the large coastal population of the country. Most of the fishermen families in India are falling under Below Poverty Line (BPL) and the grants and subsidies are provided to them by Governments to improve their living standards, however not targeting export opportunities^{7, 29}.

Referring the definition given by several international organizations such as the FAO, UNEP, World Bank and Asian Development Bank, and other inter-governmental organisation for small scale, artisanal, traditional fisheries, based on certain characteristics, India reiterates that these words are interchangeably used in many manner. The diverse sociology as well as economics in different countries, it is not at all arrived to universally considered this definition for 'artisanal and/or small-scale fisheries'. Therefore, India defines them as traditional fishers involved in fishing households or small groups of fishers. The fishing vessel they use may vary from a one-man canoe to upto 20 m, including trawlers, seiners or long-liners irrespective of as to whether these are non-motorized or small out board engines (up to 10 bhp). Their fishing is confined to close to the shoreline and may use labour-intensive technologies. Artisanal may also be defined as subsistence as well as commercial and the catch may be used for local consumption or export purpose^{7, 29}.

In view of the above, it is believed by India that special treatment for small scale, artisanal fisheries is needed in any new disciplines. In this regard, India is engaged in negotiations under NGR of WTO with considerable interest on fisheries subsidies and also observed the move by several other countries irrespective of developed and developing in emphasizing the significance of the S&DT. Looking at the substantial role played by Fisheries in the Developing countries, the Agreement on Subsidies and Countervailing Measures also identified the role of subsidies as an important tool in the economic development of developing member countries. Therefore, being a reality, in-built safeguards would be needed in any disciplines under the ASCM to adequately protect the interests of the developing countries. This shall render these member countries a comfortable policy space for addressing their development priorities^{29,30}.

Fisheries subsidy disciplines are aimed at enhancing the ambit of ASCM from its primary concern 'trade distortions' to address

problems of over-fishing and overcapacity. India, therefore, believes that in addition to the provisions in Article 27 of the SCM Agreement, several components would be required in S&DT under any future disciplines on fisheries subsidies in providing comfortable policy space to developing member countries. In this regard, the policy and planning of Governments in India advocate protection, consideration and encouragement of subsistence level fishers and also transfer technology to the small-scale artisanal fishers^{29,30}.

Sustainable Management Approach: While making policies and developmental programmes, the Government of India and Government of Odisha are adopting due diligence and caution towards the sustainable management of marine fisheries. Being the nodal Ministry for the Development of fisheries, the Department of Animal Husbandry, Dairying and Fisheries, Ministry Agriculture brings guidelines time to time for the operation of deep sea vessels in Indian EEZ vide Entry 57, list 1 of the Seventh Schedule of the Constitution of India. These guidelines also describe the need for ensuring sustainability in the operation of deep sea vessel which should not collide with the interest of other stake-holders. Compliance of CCRF, IOTC, IUU fishing etc. and other such international rules and regulations in the management of fish stock in the EEZ have also to be ensured by these vessels^{7,20}.

As a cautious approach towards sustainable management of marine fishery resources and conservation marine fish recruitment, Government of India generally imposes a uniform ban on fishing by all fishing vessels in the Indian Exclusive Economic Zone (EEZ) beyond Territorial waters including Lakshadweep Islands. The period of ban differs in its different coast i.e., in East Coast from 15th April to 31st may and in West Coast from 15th June to 31st July¹⁰. Coastal State Governments including Odisha also impose ban on fishing in the territorial water approximately at the same time. For sustainable management of marine fisheries, the Government of India has put many provisions to be followed by the fishing vessels under the Orissa Marine Fisheries Regulation Act, 1982. Besides, other agencies like the Chilika Development Authority are taken right approach and path for development of marine fisheries as well as the environmental issues related to this area^{5,10}.

Conclusion

Marine Fishers are more projected to difficulties in terms of their day-today activities due to natural hazards such as cyclones, floods, droughts and earthquakes which make several marginalized groups such as women and the poor more vulnerable. Coastal communities are also vulnerable to catastrophic events such as tropical cyclones, tidal surges, tsunamis and floods that result from heavy monsoonal winds^{5,28}. The real challenge lies there, for the policy makers. Besides, there is always a possibility of conflict between mechanized and artisanal fishing approach in search of the resource availability and capability constraints. While artisanal fishers do indeed

consider their work as something more than just a job but as a part of life, they are also realistic about the future of fishing¹⁶. This is also an area where difficulty lies for the policy makers to look into.

Looking at the probable challenges and what should be the right approach to be adopted by the policy makers in the fishery sector, it is suggested that a uniform policy through interactive governance should be implemented for the wellbeing of fisherfolk. Both the State Government of Odisha and Union Government of India should come closer to work together for the welfare of marine fisheries in Odisha. In the international front, the Union Government should work closely with the international organisations, regional organisations and intergovernmental organisations. Although Government of India has a right approach and tuning with these organisations, a holistic approach is needed towards the resource demarcation and conflict zone solution by amicable methods.

No doubts, policies are framed for development of sectors. However, socio-economics of the vulnerable group of the fishery sector should be a core part of these policies both at State Government and Union Government level. While focus should be on the education of the fisher community, infrastructure should not be neglected. Hence policy makers should not only focus on the fisheries development but also the infrastructure in terms of health, education and sanitation of fishermen community so that the real development of fishery sector shall be a reality^{7,25,27}. Further, the role of women in fishing sector is to be properly handled and duly addressed by the policy makers. Training on value addition to the younger generation as well as the women participants is most important aspect. More members in cooperative societies especially youngsters and women at the managing level should be encouraged. For this, the requisite training to such promising youngster on the basis of their willingness to cooperate must be rendered. Besides, effective processing technology and marketing arrangement should be planned and highlighted in the policies by the policy makers which will in turn help improvement of the economic condition of the small scale fishermen^{5,7,16,17,28}.

References

1. FAO, Fisheries management, 4, Marine protected areas and fisheries, *FAO Technical Guidelines for Responsible Fisheries*, 4, Suppl. 4. Rome, FAO: 198 (2011)
2. Funge-Smith S., Briggs M. and Miao W., 2012, Regional Overview of Fisheries and Aquaculture in Asia and the Pacific, Asia-Pacific Fishery Commission, FAO Regional Office for Asia and the Pacific, RAP Publication, (26) 139 (2012)
3. Urquhart J., Acott T. and Zhao M., Introduction: Social and cultural impacts of marine fisheries, *Marine Policy*, 37, 1-2 (2013)

4. Crilly R. and Esteban A., Small versus large-scale, multi-fleet fisheries: The case for economic, social and environmental access criteria in European fisheries, *Marine Policy*, **37**, 20-27 (2013)
5. UNISDR/ UNDP, 'A Toolkit for Integrating Disaster Risk Reduction and Climate Change Adaptation into Ecosystem Management of Coastal and Marine Areas in South Asia', *Outcome of the south Asian Consultative Workshop New Delhi* 6-7 March, 154 (2012)
6. The Institute of Techno Economic Studies, 'Study Report on Techno-Socio-Economic Survey of Fishermen Households in Tamil Nadu' 132 (1987)
7. Department of Animal Husbandry Dairying and Fisheries, Ministry of Agriculture, {available at: www.dahd.nic.in}, and accessed on April (2013)
8. Government of Odisha available on www.odisha.gov.in/fisheries&ard/index.htm accessed on March (2013)
9. Fisheries and Animal Resources Development Department, Government of Odisha, Annual Activities Report, 2011-12, **Part-I**, 59 (2012)
10. Chilika Development Authority, Government of Odisha, Annual Report, 2011-12, 36 (2012)
11. Sinha B.N., India- The Land and the People "Geography of Orissa", First Reprint, National Book Trust, India, 352 (2008)
12. Nayak S., New Age "Odisha Unbound", A Concise Knowledge of Odisha, First Edition, A.K. Mishra Publishers Pvt. Ltd., Cuttack, Odisha, 682 (2012)
13. Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture, Government of India, Hand Book on Fisheries Statistics, 2011, 145 (2012)
14. Sathiadhas R., Inter-sectoral Disparity and Marginalization in Marine Fisheries in India, *Asian Fisheries Science*, **22**, 773-786 (2009)
15. Watson R.A. and Pauly D., The changing face of global fisheries—The 1950s vs. the 2000s, *Marine Policy*, **42**, 1-4 (2013)
16. Trimble M. and Johnson D., Artisanal fishing as an undesirable way of life? The implications for governance of fishers' wellbeing aspirations in coastal Uruguay and south eastern Brazil, *Marine Policy* **37**, 37-44 (2009)
17. Britton E. and Coulthard S., Assessing the social wellbeing of Northern Ireland's fishing society using a three-dimensional approach, *Marine Policy*, **37**, 28-36 (2013)
18. Paleri P., Role of Coast Guard in the Maritime Security of India, United Service Institution of India, Knowledge World Publication, New Delhi, 377 (2004)
19. Basu D.D., Introduction to the Constitution of India, 20th Edition, Butterworths Wadha, Nagpur, Reprint, 509 (2012)
20. Legislative Department, Ministry of Law and Justice, Government of India, (available at: <http://lawmin.nic.in/Legis.htm>), accessed on September (2013)
21. Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture, Government of India, Hand Book on Fisheries Statistics, 2008, 170 (2009)
22. Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture, Government of India and Central Marine Fisheries Research Institute, Indian Council of Agricultural Research, Marine Fisheries Census, 2010, India, **Part I**, 145 (2012)
23. Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture, Government of India and Central Marine Fisheries Research Institute, Indian Council of Agricultural Research, Marine Fisheries Census, 2010, Odisha, **Part II**, 493 (2012)
24. Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture, Government of India and Central Marine Fisheries Research Institute, Indian Council of Agricultural Research, Marine Fisheries Census, 2005, Odisha, **Part III (2)**, 375 (2007)
25. Mathew A. N.P., Marine Fisheries Conservation and Management in India. United Nations -The Nippon Foundation Fellowship Programme, 2008-2009: 145 (2009)
26. Fishery Survey of India, Fishery Resources Survey, Assessment and Research Programme, Government of India. April, 65 (2009)
27. FAO, Review of the state of world marine fishery resources, *FAO Fisheries and Aquaculture Technical Paper No. 569*, Rome, FAO, 334 (2011)
28. Marine Areas in South Asia, Out Come of the South Asian Consultative Workshop, New Delhi 6 and 7 March, UNDP, 173 (2012)
29. Department of Commerce, Ministry of Commerce and Industry, Government of India (available at: http://commerce.nic.in/trade/international_trade.asp?id=1&trade=i) accessed on October (2013)
30. World Trade Organisation, Negotiation of Fisheries Subsidies (available at: http://www.wto.org/english/tratop_e/rulesneg_e/fish_e/fish_e.htm) accessed on October (2013)