

Impact of Environmental Changes on Livelihood of Socio-Economically Disadvantaged People with reference to Puri district, Odisha

Raghunath Das

Research Scholar, Utkal University Odisha, 751004,
Email - raghunathdas234@gmail.com

Abstract: *The present study attempts to study the impact of environment change on the livelihood of disadvantaged people with focus to Puri district of Odisha. This paper is trying to study with main objectives of the socioeconomic conditions of disadvantaged people under study and To map up the problems and environmental changes taking place in habitation under focus. The Humans close Environment and Development relation was discussed in the work through the nature-culture dichotomy. Evidences at hand showing that environment changes create problems to life and livelihood of Disadvantaged people. Climate change and other environmental factor makes adverse impact upon humans. Not only Humans affected by environmental change but entire Flora and Fauna kingdom (including marine and atmospheric) also seen the reverse damage.*

Key Words: *Environment, Climate Change, Livelihood, Disadvantaged People, Socio-economic Backwardness.*

1. INTRODUCTION:

The effects of environmental change have been felt by the post-industrial society. Human activities and developments have resulted in the overwhelming degradation of all aspects of the natural environment. Changing the preoccupied ecosystems of the environment will impact the quality of living conditions for its members. According to Ramachandran et al. (2006), in India's water requirements and demand for higher water quality have increased tremendously as a result of the combination of industrialization and intensive agriculture in the early 1980s. On the contrary, several human activities such as unplanned and uncontrolled urbanization, land use and landscape changing patterns, deforestation, release of liquid and solid chemical wastes from industries, uncontrolled and excessive use of fertilizers and pesticides in agriculture etc. have aggravated the problems of contamination of water bodies. The global environment is undergoing changes not only because of the impact of climate change on biodiversity, but also because of changes in biodiversity and ecosystem functioning that impact the social life of humans. According to Shinde and others (2011), pollution noted as greater environmental problems of present world, That is the direct outcome of a deeper social problem emerging from long-term public indifference, apathy, lack of public awareness, education, social values and poverty But they are captured by late as issues. The impacts of climate change on humans and their livelihoods are profound. The quality of social life depends on the quality of the actual environment. Environment is the composition of biotic and abiotic or living and non-living compounds that surrounds Man and its neighbours which are influenced by the intentionally or unknowingly activities/ functions of others. The term "environment" etymologically implies to "our surroundings" which directly or indirectly affects us..

1.1. Disadvantaged People:

According to the general perspective of **International Law of Human Rights**, disadvantaged groups are the people who are denied free access to the guaranteed rights in their free exercise. Based on the socio, economic, cultural perspectives, the classification of these groups vary from country to country. In general, women, children, socially, economically, culturally deprived sections, disabled, minorities etc. form part of disadvantaged groups. Poverty is the main contributing factor towards degradation of the status of these people that are classified as disadvantaged groups. The above definitions are only illustrative in nature. Despite the commitment of International Law of Human Rights towards the promotion and protection of rights of these groups, there is no agreed standard definition, concept, or standard classification of list of people who are to be classified as vulnerable and disadvantaged groups. Empowerment of the Socially Disadvantaged Groups viz., the Scheduled Castes, the Other Backward Classes and the Minorities

continues to be on the priority list of country's developmental Agenda, as they still lag behind the rest of the society due to their social and economic backwardness.

1.3. Disciplinary Conceptualization of the Disadvantaged People:

In the twenty-first century, the study of environmental issues is an inherently interdisciplinary project, spanning the natural and social sciences as well as humanities, the crucial role of the social sciences in general and sociology in particular are increasingly recognized (Brewer and Stern 2005). This is due to the rising awareness that environmental problems are inextricably linked to social problems; They result from human social behavior, which is viewed as problematic because of their impact on humans and other species, and their solution requires societal effort. The growing interest of sociologists in environmental issues in recent decades and the recognition of environmental sociology as a field are not surprising. It is not easy to sustain a sociological investigation of environmental problems, and it is a recent development in the field. The denial of equal access by a section of society to productive resources and avenues for the realization of their productive human potential and opportunities for full capacity utilization prevents them from utilizing their full potential. The major grouping of disadvantaged people in society are : The poor (Socially-economically Backward people), Aged, Women, Transgender, Children Disable People, Culturally and Linguistically Diverse People, Scheduled Castes and Schedule Tribe (From lower stratification ground).

2. REVIEW OF LITERATURE:

The scanning of literature provides good insight for research.

Haq (1995) in "Reflections on Human Development" argues that the next generations deserve the same quality of life that we enjoy today, which makes sustainability another important element of the human developmental paradigm. He also argues that what is needed to sustain is the human life. Sustainability is not a goal, just as GDP growth is not a goal but a means to an end. The debate on the environment needs to be humanised to avoid the arrogance of environmentalists who seem to be more concerned with saving trees than people. He argues that the primary aim must be to safeguard human life and the human possibilities. Every measure on the environment must be evaluated according to how much it contributes to the human well-being of most of the world's population. In short, sustainable human development must be the goal. He argues for a people-centred approach to environmental protection, as humans are the most vulnerable species on the planet earth.

Ninan and Bedamatta (2012) in "Climate Change, Agriculture, Poverty and Livelihoods" expressed sea level expansion and river water temperature is probably going to influence fish reproducing, migration and harvest. A climb in temperature as low as 1°C could affect the death rate and the topographical dispersion of fish. Before 1976, there was no oil sardine fishery in the northern latitudes or along the east coast because the sea surface temperature (SST) was too low for the resource. With warming of ocean surface, oil sardine can find the temperature in the northern scopes and eastern longitudes appropriate for endurance and rearing, in this manner stretching out the limits to bigger waterfront regions.

Forest And Environment Department activities Report (2007-08) reads that Compassionate payments to the victims of wild animal depredation is being paid (Rs. 116.00 lakhs from Non-Plan and Rs. 141.95 lakhs from Plan sector in the year 2007-08). It is another currently emerged problem for the people living nearby remote hilly land/ forest area. This situation is started due to environmental change.

Literature on Disadvantaged People

Swamy (2016), in "Climate Change Impacts" The forest dwellers and the people living in their natural habitat must coexist in harmony. Tribals having adversity due to forest degradation.

Bastian et.al (2014) in their study finds that references to vulnerable groups are relatively little present or non-existent, as well as poorly connected to language about practical strategies and socio-economic contexts, both also little present. And their conclusions offer strategies for developing policy that must meet human poor health, climate vulnerability. These specific vulnerable groups share one or a few risk factors described in the applied literature regarding risk evaluation for climate vulnerable groups: unequal access to education and lower literacy; lower life expectancy; lesser access to health related services; Having severity of chronic and infectious diseases, poor nutrition level; lower health literacy; gender inequality in response to health; unemployment and lower income issue; poor housing facility; inadequate water supply, exclusion from decision-making processes; lesser social and civic participation.

As reviewed in the literature, a great deal is known about poverty-environment relationships, there remain large gaps in understanding the linkages between human societal development and environment. Also, it is clear from the review literature that the concept of human development in its current framework is insufficient to cover the sustainability aspects of human development as it does not encompass the environmental indicators. The vulnerable

groups: people with mental health conditions, Aboriginal people, culturally and linguistically diverse (CLD) groups, aged people, people with disabilities, rural communities, children, women, and people who are socioeconomically disadvantaged are very much affected in biophysical changes of the environment.

3. METHODOLOGY:

The objectives of the study are:

- To know the socioeconomic and environmental conditions of disadvantaged people under the study area.
- To identify the problems in the life of respondents and alternate livelihood strategies and future security available for them

4. RESEARCH DESIGN AND SAMPLING:

Research design is the blueprint of research work. The present research is adopted both descriptive research design with mix up exploratory research design. The Researcher has taken disadvantaged fisherman population (under social economically backward population) for the present study because they are considered as disadvantaged group in the context of poverty, marginalization and culturally and linguistically diverse in the district. It is convenient for the researcher to collect relevant information from the district head quarter office on the problem. The Maximum respondents livelihood Fishing Activity fall under study location. They belong to disadvantaged and temporary workers category, they have total 1,71,140 in the district (10.07%). The district of Puri has 17% of the total fisherman households in Odisha after Balashore (61%) and Ganjam (20%). The major fishing villages of Puri are located in Astarang, Krishnaprasahad, Puri sadar and Gop blocks (Halder, S. 2016). Out of total 32.95 percent marine fisherman belongs to Puri District (Odisha Economic Survey 2015-16). And most of them resides in Puri urban locality i.e. Municipality area. They are living there because their livelihood is associated with this location. The size of sample consist with 100 fisherman where the researcher adopts the convenient mode of selection on the basis convenience of access and time to satisfaction.

Location and Demography of the Present Study Area:

The study area of present study situated in Sadar Block of Puri District. Balinolia Sahi and Penthakata situated nearby the sea beach of Puri. The study area Balinolia Sahi and Penthakata each are 2 K.M. away from Railway station. The selection is made through statistical procedure by gathering data from Census. The population of the district is enumerated in 2011 Census to be 16,98,730 Out of which 8, 65,380 are males and 8, 33,350 are females; constitutes 50.96 percent are males and 50.04 percent females. The decadal growth rate during 2001-2011 is 13.05 percent. The area of the district is 3479 sq.km, thus the calculated population density is 488 persons per sq km. The percentage of population living in urban area is 15.60. The Scheduled Caste population is 19.14 percent of the total population. The Scheduled Tribe population is only 0.36 percent. Among the major religious groups of the district are Hindu (97.15 percent), Muslims (2.55 percent) and Christian only 0.18 percent. The major towns are Puri (M), Nimapada (NAC) Pipili (NAC) and Konark (NAC). having population 157,837, 16,915 and 15,013 respectively. The district has four towns and 1709 number of villages.

Sociocultural Background-

The study area includes fishing villages (locally termed nolia sahi). All the marine fishermen of Puri district are mainly composed of migrant population of Telugu people and some of inhabitants. The Telugu community with their age old experience of almost more than 150 years started marine fishing in Orissa. Still now the non-Oriya group of people dominate marine fishing in the state. In the second half of 18th century the Telugu migrants developed marine fishing in Arkakhuda, Puri. The "Nolia" group of fishermen and boatmen migrated to Puri from the then state of Madras in 1908 and started marine fishing practice there (O'Malley, 1908). In the southern coastal districts of Puri, the fishermen migrated from 50 coastal villages of Ganjam district of Orissa and Shrikakulam district of Andhra Pradesh and are mainly settled in Pentakota, Bali Nolia Sahi of Puri municipality, Chandrabhaga Nolia Sahi of Konark municipality and Arkhakur of Chilka lake area (Mohanto, 2013). The educational institutions available at Balinolia Sahi are Shanti Kuthir K.G School and Ratnakar High School. And in Penthakata, there are three schools in their near location, viz., Swargadwar Primary School, Sukhalata Girl's Memorial High School, and Swardha Bidhaba High School.

5. ANALYSIS AND DISCUSSION :

Data analysis and discussion are the major part of research; the following tabulation, interpretation guides more about respondent's problem in general and research problem in particular.

Social and Demographic Information

The gathered data through empirical finding shows that 67 percent male respondents and 33 percent female respondents participated in this research. So majority respondents are male. The age group of fishermen household are the ranges as age 20-40 is 46 percent, 41-60 is 47 percent and more than 60 is only 28 percent. The respondent belongs to Hindu religion (100%). The Christian, Islam and other religion are zero in the study universe. Religion is an integral and pivotal part to each and every human being ubiquitously as it offers a complete social and religious identity to human being. It is to note here that all of the respondents belongs to schedule caste.

Table-1

Sl.No	Nature of Work	Response	Percentage(%)
1	Permanent	14	14%
2	Semi-Permanent Jobs	27	27%
3	Temporary/Seasonal Jobs	59	59%
4	Total	100	100%

Source: Primary data collection.

Data from the above Table reads most of the respondents are belonging to Nuclear family (57%) and 43% respondents who are belonging to Joint family (10%) and not at all extended family is exist present study area.

Table-2

Sl.No	Job Type	Occupations	Sample	Percentage(%)
1	Traditional Works	Fishing	38	38%
		Selling fishes	16	16%
		Marketing of Shells, Crabs etc	4	4%
		Allied Fishing Jobs(Making Boats and Sewing Nets)	1	1%
2	Modern Jobs/ Works	Aquaculturist/ Traders	1	1%
		Business (Marketing of Fish & Marine article)	2	2%
		Businessman at Fish selling centre	1	1%
		Handiart Makers	2	2%
		Casual Workers	35	35%
3	Total		100	10%

Source: Primary data collection.

The collected information from the field is shown in this way -that is 41% of respondents are choose modern livelihood for their earning and household maintenance and savings. and other 59 % available traditional occupation for their sustenance. The modern occupations are broadly categorised into Aquaculturist/Traders(1%), Business(Marketing of Fish&Marine article)(2%), Businessman at Fish selling centre(1%), Handiart Makers (2%)and Casual Workers(35%) and traditional works classified in Fishing(38%), Selling fishes(16%), Marketing of Shells, Crabs etc(4%) and Allied Fishing Jobs(Making Boats and Sewing Nets)(1%).

Table-3. Distribution of Respondents on the basis of their Work engagement

Sl.No	Working Hours	Response	Percentage(%)
1	Upto 4hours	17	17%
2	4-6Hours	20	20%
3	6-8Hours	54	54%
4	More than 8 hours	19	19%

Source: Primary data collection.

The sample follow two types of time schedule for their working. One group(fishing, hotel jobs) leaves their home very early (5 a.m) in the morning and return by 1 p.m or 2 p.m and other group (Business, Trading and casual works) varied time to time and not constant. Above table shows that 17% respondents works for 1 to 4 hour,20 % respondents works for 4 to 6 hour,54% respondents works for 6 to 8 hour and 19 % respondent works for more than 8 hours. Most of traditional workers working more hours to getting proper livelihood opportunity. But Modern works takes less time to finish it.

Table-4. Distribution of Households on the basis of Annual Income

Sl.No	Annual Income(INR)	No.Households	Percentage(%)
1	Less than 5000	9	9%
2	5001-10000	46	46%
3	10001-15000	37	37%
4	More than 15000	8	8%

Source: Primary data collection.

It can be seen from the table that percent 55% (9%+46%) households lie in the income group below Rs10000 and 45 percent had an income above Rs.15,000.

Table-5. Distribution of Households on the basis of Earning Members

The members of most of the disadvantaged people's family are directly or indirectly connected with various occupations. So it is essential to find out the number of earning or working members in a household. This is presented in Table.

Sl.No	Earning Members	No.of Earning Members	Percentage(%)
1	One	67	67%
2	Two	26	26%
3	Three	7	7%
4	Four	0	0%
5	Five	0	0%
6	Total	100	100%

Source: Primary data collection.

It is evident from the Table that maximum number i.e. 67% percent of earning members having single earning members, 26 percent of the total households have TWO earning members and only 7 percent THREE earning members. Thus in most households, the earning family members were fewer.

Expenditures and Consumption Pattern

Expenditures of households is determined by the habits, beliefs, customs, sources of income, size of the family, access to education ,patterns of entertainment ,etc. From the table it can be clear,59% respondents uses above 5000INR for housing,51% respondents less than 2000INR for fuel consumption,69.21% respondents uses electricity more than 1250INR and 12% of have not electricity connection, while approximately half of total respondents(49%) uses more 12000INR for fooding purpose, one-third respondents (32%) uses more than 10000INR for healthcare and treatment in the present study area. Other types of consumption takes in this way as half of total (53%)consumes less than 1000INR and other halves (47%)consumes more than 1000INR for transportation, majority(62.82%) uses a few Rupees of 5000 for education and 37% uses more than 5000INR while 30% of respondents have not concentration towards education. Of total 89% respondents going for leisure and recreation but 11% not went for that. The main places of their recreation is roaming at Beach. One-third of total(34%)respondents had less than 2000INR for Household maintenance ,half of total (53%) consumes in between the ranges of 2000INR to 5000INR and only 13% respondents uses more than 5000INR for household maintenance.

In all the items of expenditure- Housing, food items and fuels entail a major share of the total consumption expenditure. Shares of expenditure on food and fuel are high in lower income class group .The primary data represents that Majority of households (78%) has taken loans from Banks, cooperative, SHG funds and money lenders .A few households have not any loans but sometimes borrows money from same or upper class people in their community.

Table 6. Distribution of frequency on the basis of Changes in Pattern of rainfall

SL. No	Response on Changing in Pattern of rainfall	Response	Percentage (%)
1	Yes(64%)	Increased-12	18.75%
		Decreased-52	81.25%
2	No	29	29%
3	Don't Know	7	7%
4	Total	100	100%

Source: Primary data collection.

Data analysis can be made in this way that the majority of respondent (64 percent) have agreement with the response on changing pattern of rainfall and 29 percent of total are not agreed at all. 7 percent are not comments on that particular subject. The pattern of rain fall changing over the year no doubt. Cross check data also available.

Table.7

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/	May-Sep
2010	0.8	3.5	0.3	0	146.1	168.2	182.3	391.6	245.2	270.1	108.2	59.7	1576	1133.4
2011	0	10	0	10.7	109.1	156.9	214.2	259.8	270.2	22.6	0	0.5	1054	1010.2
2012	6.7	0.1	0	49.9	19.2	171.7	262	287.8	206.6	94	177.1	0	1275.1	947.3
2013	0.1	1.7	0	18	53.1	205.3	270.2	222.2	183.8	586.2	0	0	1540.6	934.6
2014	0	1.3	20.4	0.5	100.6	71.7	528.6	258.5	389.6	101.5	0	3.9	1476.6	1349

(Source- Indian Meteorological Department)

Effects from Shoreline Degradation that are facing by respondent

Geographical information provides that 71 percent of earth's surface surrounded by water and rest 29 per cent is usable, covered with forest and ice slates land. Environmental and navigation forces sometimes became route soil erosion and degradation. This also affects both Flora and Fauna. Human life and livelihood encounters numerous impacts from that particular environmental problem. Enlisted effects of shoreline degradation are Lack of land resources and loss of rest places of respondent (34%), Increased Life risk of respondent due to Higher rate of reef current (29%), Changes in Ecology(21%), Loss of shelter belt from near shoreline (51%), Loss of rest places, shelter trees from casual workers local environment (67%), Displacement of Boat station respondent(77%), Loss of marine & water related and salt business etc.(43).

Preventive measures from respondent to treat the loss of shoreline :the following list includes respondents' responses to treat the loss of shoreline. Out of total 100, there are 69 responses – To Build up concrete walls, embankment barricade and dikes near to the sea, 58 responses to choose Alternative jobs for shell collectors and marine article related businessman, 84 responses adapting plantation of trees near the sea, 49% responses -special training on environment protection such as use of biodegradable and non-biodegradable dustbins and water use pattern, 38 responses-development of skilled and trained managerial workers to maintaining shoreline, 32 responses to Control over bomb testing and other devices inside the sea.

Choice of Occupation: Skill and efficiency are very essential in small to great jobs. Training is essential to obtain higher skills and efficiency. This is true for all sector. Majority of the respondent agree to alter their livelihood and modes of work. Lack of resources and availability of work over the year. A specific kind of observation (as training) is needed improve work practice. Traditional works are done by this process, while in modern jobs it quite changes and requires special training for 6month to 2 years.

Table-8. Distribution of Frequency on the basis of Adapting Livelihood

Sl.No.	Adaptation	No. of Respondents	Percentage
1	New Livelihood	19	19%
2	To Alter Livelihood	17	17%
3	Change in mode of work	31	31%
4	Altering mode of earnings	8	8%
5	Practice of wage Labour	25	25%
6	Total	100	100%

Source: Primary data collection.

The data regarding the Availability of suitable livelihoods represented herein of total household, majority respondent (48%) agree to change their livelihood and alter mode of work, One fourth respondent (25%) ready to practice as a wage labour and 19 per cent ready for accepting new livelihood because previous livelihood and ways of living precarious to them. From total better halves (52.16%) gathered by children and rest by self and family members. Most female members doing such works permanently but they not selling it to anyone but making those items into handcarts and keeping those things in their homes. There is not much information on the importance of insurance. Access to insurance requires more money or financial resources. The willingness to insure individual himself or their family members depends on higher economic condition or higher educational level of the household. Of total there are 41% and 7% respondent having life

insurance and insurance of assets respectively. But majority have not insurance at all. They are claiming that insurance is not important, too expensive and they not thought about insurance and its benefit. There have much information on the importance of present and future security of the respondent. They are agreed that majority of them (83%) fully secured by nature and state provide security, while 15 percent are not secure and 2% not responding at all. There is a fear and uncertainty among 68 percent respondent on their livelihood and access to natural resources. There future is not secure they state in the present study.

6. SUMMARY:

The impact of environmental change on the life and livelihood of the disadvantaged people follows the model in detail.

Livelihood-

The adverse impact of changing environment affects severely to the fisherman and casual workers.

- Major part of people's livelihood (Agricultural; cultivation, fishing, domestication, mines works etc.) depends on nature while minor part depends on the products of major part. The environmental change affects directly and also indirectly to the people with working and non working category. The working people facing many problems at large like lack of access to natural capital (natural resources-food, fish, fruit and other resources), less human capital (labour capacity, knowledge & skill), lack of access to social capital (discrimination, poverty), lack of access to financial (wage, credit) and lack of access to physical (communication, instrument). Environmental change leads to diversification and extension of their livelihood and migration. The less availability of physical and natural resource causes to extension of their livelihood and nothing availability of such resources causes to diversification of their livelihood.
- Unsuitability of livelihood and low access to resources enforces migrants to migrate respondents. Because of present work is risk full and they feel fear and uncertainty in present work. Health risks of severe cold and fog during winter and excess heats and sunstrokes in summer. They are suffering the skin-burning during the work hour of summer.
- The marginal workers working hour also extends due to environmental changes. For example- the fishing works inside the sea takes more time to catch fishes. Now catches are not more available to catch with comparison to previous time. The decision-making process regarding time of production (catches) is very important in the whole production process and in production analysis. The decision of time of fishing is treated as the time of production. So fishermen are taking their own decision regarding the time of fishing. They takes more time to catch more which is adverse in nature.

Social-cultural Sphere Many more problems like food insecurity, safety and security and disaster risks have been seen in the socio-cultural sphere of the respondents.

- Food supply (unavailability of more no. fish) is negatively affected by environmental change, it was witnessed from respondents answer that fisheries resources not available at large in the sea due to rising water level rise and excess temperature.
- Unavailability of foods and lack of access to fishery products enforces fisherman disadvantaged people to migrate another place. Migration of human race create number of risk like landlessness, joblessness, homelessness, insecurity, disarticulation etc.
- Disturbance in natural setting causes number of disaster risk. Extreme weather, excess heat, cyclone, floods and accident during workplace are the scheduled hazards of the respondents.

Economy-The economy of disadvantaged people can be seen from very marginality. They are belongs to the social exclusion category on the basis of discrimination, poverty and low income. The environmental change loses the livelihood. And relatively it affects the mode of work, types of working and work hour such as increase of intermix work, choosing and accompanying secondary livelihoods in place of their leisure and recreation and searching more fish inside the sea or increased duration of their work. The burden of family management, indebtedness and health related more expenditure causes vicious circle of poverty.

Recommendations for better Livelihood Opportunity

- Prioritizing the needs of the most vulnerable in climate change adaptation efforts, particularly disadvantaged community – who will bear the brunt of climate change far longer than other mainstream.
- Reducing inequalities among disadvantaged people now to promote their future resilience to climate change and other disasters or crises.
- Focusing to and acting on dalit perspectives on climate change.
- To Providing education, awareness to people facing adverse climate change and developing mechanism in local and global sphere.
- Aligning and coordinating work on climate change adaptation, preparedness and disaster risk reduction at national and state levels with special references to climate vulnerable groups

- Protecting and providing good livelihood opportunities (by getting support from natural, social, and financial resources) among disadvantaged people's families who are forced to move as a result of climate change.
- Scale-up proven approaches to address the changing needs of disadvantaged people.

There is need to continuously engage international community to deal with environmental risks. In India (other countries having maximum coastal belt) needs strong national strategy for coastal shelter protection by planting more trees and further preserving country's ecological condition .And maintaining sustainable economic growth model. This path is based on its unique resource endowments, the overriding priority of economic and social development and poverty eradication, and its adherence to its civilization (specifically including disadvantaged people) legacy that places a high value on the environment and the maintenance of ecological balance at regional sphere. In the journey to large scale development, the country has a wider spectrum of choices precisely because it is at an early stage of development. The national vision should be made from sustainability and eco-friendly. Loss of livelihood causes lower standard of social life and lowering way of life maintenance, therefore to maintain a happy life first needed to have a sustainable livelihood.

REFERENCES:

1. Hannigan, J. A. (1995). *Environmental Sociology: A Social Constructionist Perspective*. United Kingdom: Routledge.
2. Stern, N. (2008). The economics of climate change. *American Economic Review*, 98(2), 1-37.
3. Costello, A., Abbas, M., Allen, A., Ball, S., Bell, S., Bellamy, R., ... & Patterson, C. (2009). Managing the health effects of climate change: lancet and University College London Institute for Global Health Commission. *The lancet*, 373(9676), 1693-1733.
4. Ninan, K. N. Satyasiba Bedamatta (2012) *Climate Change, Agriculture, Poverty and Livelihoods: A Status Report*. Institute for Social and Economic Change, Bangalore.
5. Swamy, R.N(2016), *Manorama Year Book 2016*, Malayala Manorama Press, Kotayam
6. Mahbulul Haq (1995) *Reflections on Human Development* Oxford University Press, New York
7. Forest And Environment Department activities Report (2007-08) Govt. of Odisha, Bhubaneswar
8. Seidel, B. M., & Bell, E. (2014). Health adaptation policy for climate vulnerable groups: a 'critical computational linguistics' analysis. *BMC Public Health*, 14, 1-15.
9. District Handbook Puri, 2011, Census of India, GOI
10. IPCC AR5 WGII: *Climate Change 2014: Impacts, Adaptation, and Vulnerability* (IPCC Fifth Assessment Report). IPCC; 2014. Accessed on 3 April 2014 <http://ipcc-wg2.gov/AR5/report/final-drafts/>.
11. Institute of Tropical Meteorology Report, 2014, Ministry of Earth Sciences, GOI ,Accessed during 2014-15, (<https://www.imd.gov.in/Welcome%20To%20IMD/Welcome.php>)
12. UNDP REPORT NOVEMBER 2014 ``Hazard Risk and Vulnerability Analysis (HRVA) of Management the City of Bhubaneswar (Odisha)``
13. Von Braun, J., & Gatzweiler, F. W. (2014). Marginality: Addressing the nexus of poverty, exclusion and ecology (p. 389). Springer Nature.
14. Postel, S. (1992). *Future of Earth: It is Now or Never*. *Survey of the Environment*.
15. Banerjee, A. (1998). *Environment, Population, and Human Settlements of Sundarban Delta*. India: Concept Publishing Company.