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Winter 11-5-2019

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KALINGA, KIRTI K and Rath, Navaneeta, "A comparative assessment of climate change related knowledge and perception of Coastal and Tribal community" (2019). *Library Philosophy and Practice (e-journal)*. 3602.

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# **A comparative assessment of climate change related knowledge and perception of Coastal and Tribal community**

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## **Abstract:**

Climate change is a global problem with local ramifications. It supposed to impact all nations and states across borders. But the way it is perceived by different stakeholders varies. Perception towards climate change matters because it will shape the way knowledge is framed and risk is calculated. It is also important to examine the knowledge of those people who are affected the most due to climate change. The present paper tries to understand the perception of farmers on climate change. As agriculture is one of the most climate sensitive sectors, it becomes pertinent here to explore are the farmers aware about climatic changes or not. The study has taken two different communities, i.e. tribal and coastal community and tries to find the difference in their perception. It was found that even though the literacy rate is low but majority of the members are well aware about climate change and its different indicators.

**Keywords:** Climate change, Perception, Knowledge, Tribal community, Coastal community, Odisha, India.

## **INTRODUCTION**

Climate change, a serious crisis of current millennium, continues to be a threat across countries and sectors. As its impacts transverse different domains of public life, it has perplexed policy makers, academicians and civil society organizations. As climate change is related to variations in earth's atmosphere, the task of dealing with it was first assigned to natural science community. But soon it was realized that impacts of climate change affects the community members, who have been left out of the discussion. Therefore, it became pertinent to explore the knowledge, perception and vulnerability of people to grasp all the aspects of vulnerability towards climate change.

Studying the physical impacts of climate change in isolation without considering the perception and knowledge base can never reflect the factual vulnerability as it is. There is a need to study perception to understand what people perceive to be vulnerable and what the risks are, for which they feel threatened. Analysis of perception explores how individuals identify those risks, rank them and take necessary actions to counter them (Adger, 1999). People's perception of climate change risk is a product of their existing social structure and culture. Social interactions, institutions and cultural ideologies frame perceptions of vulnerability (Adger, 1999). Therefore, it becomes imperative here to analyse the role of perception of climate change by the farm households as it is the facilitator to future adaptation strategies. Perception of climate change by the community members involves two stage processes. First, the belief in the existence of

climate change; second, determining its significance against other stressors. Recent studies from India into rural people's belief and understanding of climate change suggested that most respondents detected changes in the climate but they did not hear about the scientific concept of climate change. Many people were not aware of the global phenomenon of climate change and assumed that the changes were local.

## **Climate Change**

The issue of Climate change may seem remote when compared to immediate visible problems like poverty; terrorism and economic stagnation but it is a serious and long-term threat that has the potential to affect every part of the globe and every sector of economy. The negative impacts of climate change are expected to disproportionately affect developing countries like India, especially the poor and vulnerable within these countries. They are already vulnerable and sensitive to external stresses; climate change risks may exacerbate the social and economic conditions. Highly uncertain risks are expected to affect many sectors of economy (i.e. agriculture, fisheries, energy, tourism, forestry, water resources, etc.) which may contribute to food insecurity, infrastructure damage and degradation of natural resources that are essential to the livelihoods of the communities. This may prove detrimental to realize the development priorities.

## **Perception**

Forgus and Melamed (1976) consider perception as the process that dictates how human beings interpret their environment and surroundings". Steward L. Tubbs & Stylvia Mors (1999) define Perception as "an active process as one selectively perceives, organizes and interprets what one experiences. Interpretations are based on the perceivers past experiences, assumptions about human behavior, knowledge of the others circumstances, present moods / wants / desires and expectations."

This clearly indicates that perception regarding climate change is a product of the accumulated experiences and knowledge about weather and climate patterns. Therefore, the present paper tries to unravel the perception of people about climate change in two different communities: coastal and tribal. It is necessary to understand do they consider climate change as a risk and how much they are concerned about the issue.

The study has the following objectives:

1. To study the perception of the community members towards climate change
2. To study the role of institutional and individual factors in shaping the knowledge about climate change

## **RESEARCH METHODS**

### **Selection and Description of Study Area**

India is a South Asian country with prone to natural calamities. Odisha is one of state in India which is the most environmentally fragile area and is prone to climate change. Recurrent cyclones like the Super cyclone of 1999, the Phailin of 2013, Hudhud of 2014 and Fani of 2019 have placed the state strongly in the vulnerable map of the country.

The researcher has taken two different geographical area of Odisha; one is coastal and the other being tribal. For coastal area, the researcher has taken Kendrapara and for Tribal area, the researcher has taken Mayurbhanj.



Source: <https://odishaassembly.nic.in/map.aspx>

Kendrapada lies in central coastal plain zone as per the Agro-Climatic Classification of the Odisha. The district is facing disasters of high intensity and is prone to various climate parameters. This makes Kendrapara highly fragile and prone to extreme events (Info Change 2002). Mayurbhanj lies to the north of Odisha and is one of the highly tribal dominated areas and is also affected by climate change.

### **Sampling Procedure**

Multi stage sampling procedure is adopted. Purposive sampling technique is applied for selecting research area and random sampling is used for selecting the sample respondents. Following the procedure, 400 sample households were selected comprising of marginal and small farm households, semi medium and medium and large households.

The study is conducted in Rajnagar and Mahkalpara block of Kendrapada district and Kaptipada and Thakurmunda block of Mayurbhanj district. Four villages are selected from each block. The villages are Satavaya, Pentha, Kandrapatia and Kanspal from Kendrapara and Noto, Kadabahali, Jambani and Jamunalia from Mayurbhanj.

### **Data Collection and Analysis**

The study resorted to both primary and secondary methods of data collection. Data collection was carried out during 14<sup>th</sup> May 2017 to 25<sup>th</sup> June 2017. The study utilized mixed methods. Both qualitative and quantitative approaches were used. Structured interview schedule, FGD and observation tool was used to elicit information from the sampled respondents. For analyzing the data, simple statistics was used.

## FINDINGS

At first the researcher was interested in exploring the demographic profile of the study area taken. The outcomes have been projected in Table No1.

**Table No. 1**  
**Demographic profile of sample households**

Villages	Average family size	Average earning members	Average number of dependents	Percentage of adult males in percentage	Percentage of adult females in percentage
<b>Coastal</b>					
Satavaya	4.6	1.36	3.1	53	47
Pentha	3.9	2.1	1.85	49.5	50.5
Kandrapatia	4.6	1.3	2.98	47.6	52.4
Kanspal	4.3	2.85	1.49	49.7	50.3
Average for Coastal area	4.35	1.9	2.38	49.95	50.05
<b>Tribal</b>					
Jambani	5.18	3.04	2.14	54.91	45.09
Jamunalia	4.35	2.14	2.2	49.2	50.8
Kadabahali	5.15	2.78	2.37	49.03	50.97
Noto	4.57	2.53	2.04	49.74	50.26
Average for Tribal area	4.81	2.62	2.19	50.72	49.28

Source: Primary survey

It was estimated through the survey that the average family size in coastal area (4.35) is smaller than that of tribal area (4.81). Again the average number of earning members is more in the tribal areas (2.62) compared to the coastal areas (1.9). But the dependency rate in the coastal area (2.38) supersedes that of tribal area (2.19). There is a subtle difference in percentage of adult males and adult females in these two regions. The female number is lower in tribal area (49.28) where as the number of male is lower in coastal area (49.95). The justification for difference in

family size was interrogated from the key resource persons who brought to limelight two important factors for which the family size becomes higher in tribal regions in comparison to coastal regions. The reasons are: In the tribal regions till date the small family norm is not well adhered to whereas in the coastal areas because of better government interventions and self consciousness, people tend to have smaller family. Again in the villages studied in the coastal region, limited livelihood options are available because of climatic changes which lead to higher migration rate than the tribal areas.

The difference in the earning members has emerged in the study due to the non availability of adequate livelihood options in the villages of coastal areas in the study vis-à-vis the availability of some options in the tribal areas. This indicates that the coastal areas are highly vulnerable than the tribal areas. Dependency ratio depends on non earning members and total population. In the coastal areas, it is the non earning members who significantly contribute towards escalating the number of dependents. But in the tribal areas the early and the late age work reduces the number of dependents though the family size is high in comparison to coastal area.

After analyzing their demographic profile, the researcher wanted to analyse their perception towards climate change.

To capture the overall knowledge of the respondents on climate change, a simple question was put forth to the respondents “Do you feel that over the years there is climate change in your locality?” In this connection the responses that were elicited from the respondents are projected in table no 1

**Table no 2**  
**Knowledge of Respondents on Climate Change**

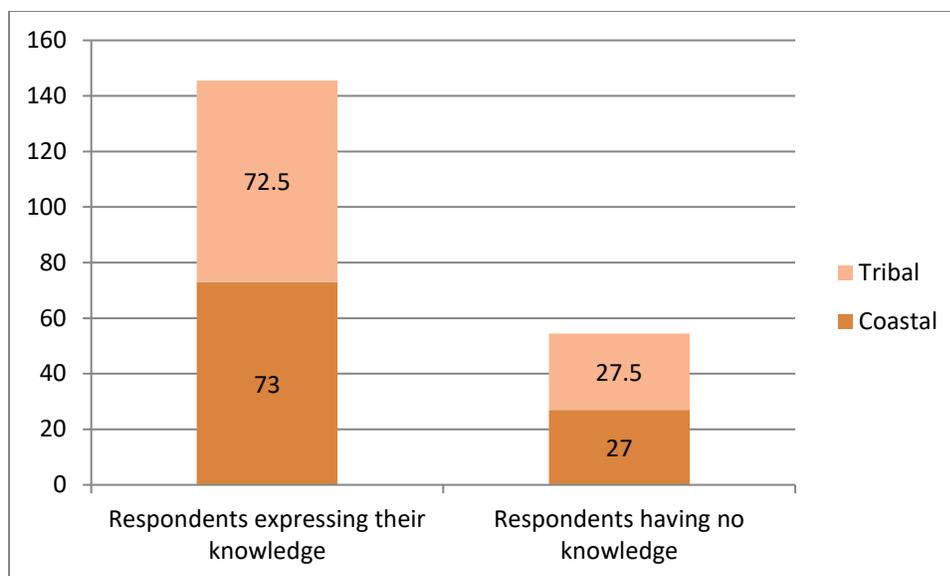
**n=400**

Nature of study setting	Respondents expressing their knowledge	Respondents having no knowledge	Total sample respondents
Coastal	146 (73)	54 (27)	200
Tribal	145 (72.5)	55 (27.5)	200
Total	291 (72.75)	109 (27.25)	400

Source: Primary Survey. Figures in the parenthesis reflect the percentage.

It is graphically presented in the Chart no. A

**Chart no. A**



As it becomes visible from the foregoing table and the chart, the knowledge of climate change is almost uniform and does not have any location specific variation as 73 percent of coastal respondents and 72.5 percent of tribal respondents expressed positively about their knowledge on the issue. Ignorance is equally uniform in both the settings almost round or plus 27 percent. Thus, experience of climate change is universal having no variation on spatial basis.

As the researcher from the pilot study found that the respondents continue to confuse short term weather patterns with long term climate trends. Therefore, the next effort was geared by the researcher to assess the knowledge of the farmer respondents on the “expressive indicators” of climate change. Here the expressive indicators can be defined as those indicators which have outward manifestation and are observable as well as are experiential. It supposed that these indicators have an easy connotation in the common sense knowledge of the people who interact in a particular environmental setting.

The outcome of the responses to this query is incorporated in Table no. 3

**Table no. 3**

**Locality based distribution of respondents on the expressive indicators of Climate Change**

**n=146**

**n=145**

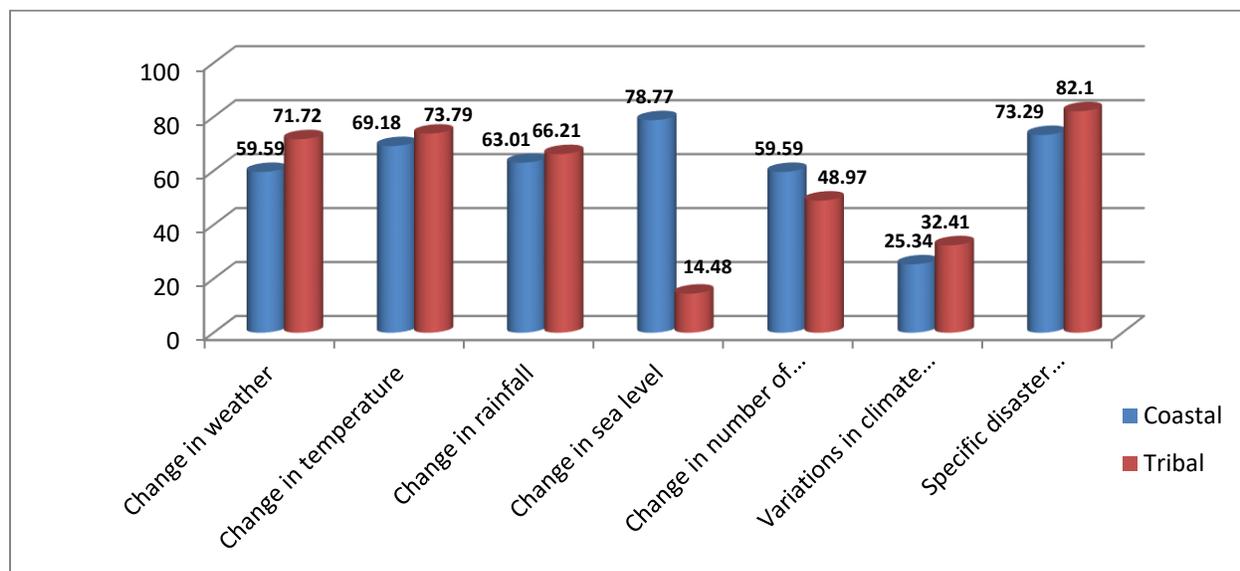
Parameters	Coastal	Tribal
Change in weather	87 (59.59)	104 (71.72)
Change in temperature	101 (69.18)	107 (73.79)
Change in rainfall	92 (63.01)	96 (66.21)
Change in sea level	115 (78.77)	21 (14.48)
Change in number of extreme events	87 (59.59)	71 (48.97)
Variations in climate	37 (25.34)	47 (32.41)

(humidity, soil texture )		
Specific disaster (Flood, drought, cyclone, etc)	107 (73.29)	119 (82.1)

Source: Primary Survey. Figures in the parenthesis reflect the percentage.

The expression of knowledge in terms of expressive indicators by sample respondents of the two distinct study settings are being posted in Chart no 5.C

**Chart no. 5.C**



The foregoing table and chart clearly express the fact that people of both the localities have a stock knowledge on climate change in terms of different expressive indicators. Though the knowledge about climate change is universal but the number subscribed to it is not uniform across selected localities. The researcher observed proximate uniformity in terms of knowledge on certain parameters like change in temperature and rainfall, change in weather and extreme events, variation in climate and disaster related indicators. However, there was a marked difference in the knowledge with regard to change in sea level parameter. During interaction with key informants, the researcher noted that because of unavailability of sea in tribal belt, this experience is not recorded by the people of tribal areas. On the other hand, sea plays a significant role for the people from the coastal belt that is in the vicinity of the sea and shares their everyday life experience. As sea is an integral part of everyday life experience of people from coastal area, change in sea level parameter is an extra addendum to their knowledge.

Those respondents who expressed their clear cut knowledge on climate change were asked to indicate the source of their knowledge. It was vital on the part of the researcher to locate the source point of their knowledge because climate change is a mega social issue which has been brought into public and popular concern in the recent days. Policies are framed; programmes are designed to generate awareness among people on the issue. Taking into consideration such

consorted efforts by the state and non-state actors, the researcher felt it a mandate to locate the knowledge generation source points from the study settings and study sample. In this connection, the admittance of the sources of knowledge by the respondents is presented in the Table no. 4

**Table no. 4**

**Distribution of Respondents on basis of their admittance of source of knowledge**

n=146

n=145

			Coastal	Tribal	
Individual	Primary group	Family and friends	62 (9.86)	12 (3.27)	
	Secondary group	Community and neighborhood	87 (13.83)	41 (11.17)	
			149 (23.69)	53 (14.44)	
Institutional	State actors	Government	82 (13.04)	43 (11.72)	
		PRI members	97 (15.42)	39 (10.63)	
		Schools	31 (4.93)	19 (5.18)	
	Government media	Electronics (Television)	21 (3.34)	06 (1.63)	
		Radio	45 (7.15)	47 (12.8)	
			276 (43.88)	154 (41.96)	
	Non State actors	Corporate and Industrial houses	03 (0.48)	01 (0.27)	
		Civil Society Organizations and NGOs	121 (19.23)	109 (29.7)	
		Private media	Print (Newspaper)	21 (3.34)	08 (2.18)
			Electronics (Television)	27 (4.29)	07 (1.91)
			Radio	32 (5.09)	35 (9.54)
				204 (32.43)	160 (43.6)
		629	367		

The study noted that climate change has become a matter of concern for the policy designers, general public, civil society organizations and institutions like media houses. All these sources have played a profound role in generating awareness which is well reflected in the foregoing table. For the sake of better analysis, the researcher divided the agents into twin group i.e. individuals and institutional. Individual sources are those which disseminate knowledge through interpersonal interaction in an informal way. The institutional agencies are those agencies which cater to diffusion of information in a strategic manner through established sources. In the present survey, it was noted that both individual and institutional agencies have a decisive role in knowledge generation. However, the differences were found to be proactive for individual agencies in coastal regions (23.69 percent) where vulnerability rates are higher and depth of

climate change is more perceptible. In the tribal areas, the role of these agencies was found to be minimal with 14.44 percent because of the fact that climate change concerns are yet to engrain in tribal areas. Another perceptible feature that emerged from the study was that institutional agencies have a predominating role in knowledge generation than the individual agencies as 76.31 percent in coastal area and 85.56 percent in tribal area relied on institutional agencies. This establishes the fact that climate change is taken up more as governance issues, than an issue of common man.

The individual agents were divided into two sub categories of primary and secondary group. The secondary group played a more prominent role than the primary group as 13.83 percent in coastal area and 11.17 percent in tribal area got information from secondary group compared to 9.86 percent and 3.27 in coastal and tribal area respectively from primary group. This establishes the impression that climate change in both coastal and tribal areas is more a public issue than a private issue. (But it is high time now that public issue needs to penetrate into households as private issues and individuals have to be forth coming in enduring and encountering this phenomenon.)

As far as the institutional agencies are concerned, the study noted that, the role of state actors supersede to that of the non state actors in coastal area where 43.88 percent respondents said they got information from state actors compared to 32.43 percent for non state actors. There is a slight difference in tribal area as 41.96 percent relied on state agencies compared to 43.6 percent on non state actors. Among the state actors, the study noted that in the coastal areas, PRI members have played an extensive role as 15.42 percent respondents depend on them and the government too has played a significant role. 13.04 percent respondents bank on Government agencies for generating awareness. The role of schools has been found to be minimal both in coastal (4.93 percent) as well as tribal areas (5.18 percent). Thus, the study concluded that climate change has still not come into the process of school primers, classroom instruction and transactions. Socialization of climate change is lacking and awareness generation is found to be at climax period. Knowledge generation only through dissemination at the point of crisis can do little compared to socialization which is a long ingrained process that brings resilience building. (Thus, the study concluded that response to crisis is taught through extempore awareness generation but hardly any effort is given to resilience building which is the need of the hour.)

The role of media is also found to be negligible in normal times as reported by respondents. It becomes amplified only during the times of any forthcoming crisis as well as some days of its aftermath. Electronic media has a low coverage as only 3.34 percent in coastal area and 1.63 percent in tribal area got information from them. Rather Radio serves as a vital gadget in times of disaster where 7.15 percent in coastal area and 12.8 percent in tribal area depend on it. (Sustainable media exposure and representation of climate change is the need of the hour to develop sustainable coping up techniques for climate change.)

As noted by the researcher, the role of corporate and industrial houses in climate change knowledge generation and dissemination was found to be negligible in the study with only 0.48 percent in coastal area and 0.27 percent in tribal area mentioning their role. This requires sensitization of corporate and industrial houses to bring climate change issues into their domain of corporate social responsibility.

The role of NGOs and civil society organizations were found to be tremendously spectacular as respondents from coastal (19.23 percent) and tribal areas (29.7 percent) expressed that these institutions though are non state actors are playing a significant role in awareness generation. A detailed discussion with the participants brought to limelight the fact that NGOs are making doorstep campaigning, public assemblies to generate knowledge on natural as well as anthropogenic determinants of climate change and are providing ways and means for making the coping mechanisms of local farmers easier and smoother to the process of climate change to secure their livelihoods. Climate change is more a public dialogue than a private issue. It needs to make a move both ways from public to private and private to public, in order to make the knowledge more deep rooted and strong.

Since it is a matter of public dialogue, the beneficiaries are mainly the male and very often the women, children and the elderly who are badly affected do not have the basic knowledge on the issue. So, the climate change debate needs to have a better trickledown effect.

The role of government and PRI members needs commendation but climate change issue needs to adorn the primers and classroom transactions for better socialization to develop resilience as well as quick response from people's front which is missing till date.

The proactive role of media before, during and after an extreme event becomes prominent but it needs to be a regular affair to have an impact on generation. Again, in the media, print media has a nominal role due to ignorance of people and inaccessibility of the areas. Among the electronic media, radio plays a vital role in generating awareness. There is a need to strengthen community radio to reach people in a better and easier way and to use local knowledge and local situation to battle against climate change and develop people's resilience to it.

## **CONCLUSION**

The current paper found that both the community members (coastal and tribal) are well aware about climate change. The experience of climate change is across location, but, its degree may vary. Though they may not be acquainted with the term "climate change" but they have explicit knowledge about the various expressive indicators that essay climate change. Institutional agencies played a greater role in making the community members aware about climate change. Both Government and non government sector has been proactive in communicating about climate change.

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