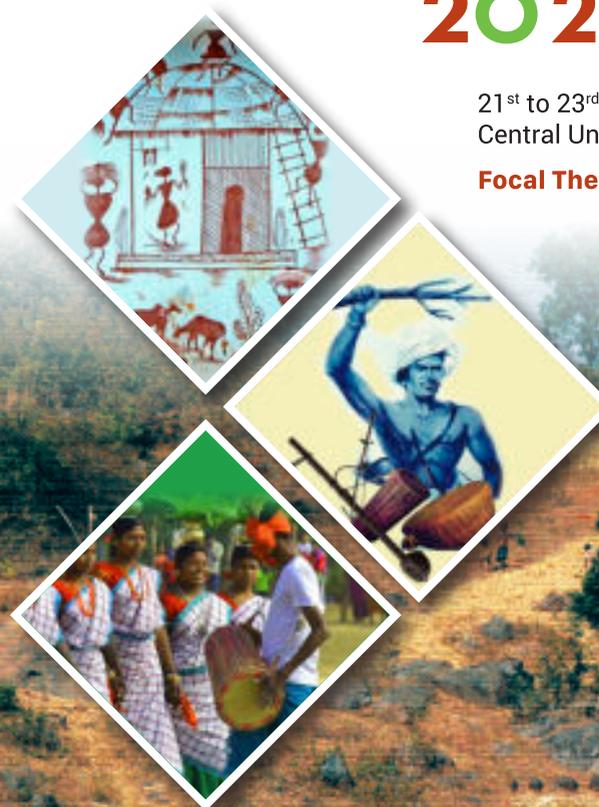


ODISHA ENVIRONMENT CONGRESS 2022

21st to 23rd December 2022
Central University of Odisha, Koraput

Focal Theme: Environment and Tribes



Proceedings

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2022

ORGANISED BY

HDF-cDAR, Bhubaneswar
Center for Environment and Development (CED), Thiruvananthapuram
Central University of Odisha, Koraput
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Proceedings of the
Odisha Environment Congress - 2022

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Editorial Note

In normal phraseology environment refers to natural surrounding that comprehends all living and non-living things existing as integral parts of nature. The 'built environment' refers to the surrounding that has been conditioned by human intervention, fundamentally a transformed landscape such as forest and agricultural land conversion for non-agriculture purposes to meet the human needs as well as greed. It includes all associated socio-economic activities too. Therefore, the 'built environment' is a tempered and modified form of natural environment. This process includes human and non-human entities wherein living entities like vegetation, all living macro and microorganisms, and the non-human entities like soil, water, light, temperature, rock, atmosphere, air and the energy are affected. Within 'built environment' we have two categories of people viz: the less mobile, nature dependent ethnic groups and more mobile market dependent human groups. Both differ in their perceptions and responses towards natural environment.

Though some non-human animals who modify natural environment and build things to provide a better and protective environment for themselves. So long nature functions in its own principle of change and continuity, the biosphere, by and large, remains safe because naturalness varies in a continuum. This is largely the areas of native small ethnic communities who line with nature. The greed of market dependent human group tries to control over natural forces and alters the process environmental continuum which often begets devastating phenomena and terminates at a point of no return. The response to such phenomena varies across human groups. People in the lap of nature lament, are attributing the adverse impacts of environment as wrath of supernatural entities and try to appease through praying and offering sacrifices to the supernatural power. They have their own logic and explanation for propitiation, while others realise their greed as the causes and sources of unhealthy environment and try to adopt strategies based on technology. Thus, they are techno dependents although most of them are aware of the fact that where there is diversity there is security. For example, surface mining is anti-forest in nature and the native ethnic communities known as scheduled tribes in India inhabit in the areas where we have mine and mineral deposits. With the excavation and quarries the loss of soil and water reduce the items in food basket of the natives trapped them into the malnourished section of population.

For the last five decades criticisms of the term tribe have been carried out. Violent attacks have been made against ideological use of this of concept. A few serious scholars have demonstrated how the term is ideologically manipulative and politically harmful. Like the concept of race, which once proved to be scientifically irrelevant and exposed to its

political use to justify exploitation and dispossession of supposedly inferior peoples of the vast areas of globe, it was expected that the tribe would become redundant at least in academic discourse. To our surprise it is seen neither the race nor the tribe has been removed at the global level.

Before India was colonised by British there was no equivalent indigenous word for the English term -tribe and no community of people outside Hindu fold was ever given a derogatory exonym. The most available word was *Janah* in Sanskrit that referred to a community of non-monarchical type and of common cultural pattern. People in general use terms like *pusush jati nari jati*, *Angreji jati*, *German jati*, *Ucha jati*, *Nich jati*, *Vanaspati jati* to refer to gender of people who speak a language, people of definite country, socioeconomic status, plant product etc. Thus, the term *jati* is a poly-semantic term. Thus, *jati* was used as a mode of classification. Earlier we were using the term *Jati* to refer to a definite social category with a suffix to their ethnic name in Indo-aryan language to refer to all independent social categories like Brahman *jati* and Kandh *jati*. In their own dialect almost all communities have their independent ethnic names which refer to people who are integral part of nature. Similar social categories were referred to by number of terms like *Adim jati*, *Bana Jati*, *Adya jati*, *Adivasi*, *Banabasi* etc. Therefore, it is a mode of classification in the context of community identification After they get enlisted, they are now known as *Anusuchit Jana Jati* (Scheduled Tribe). Anthropologists started studying 'tribal' community in second half of 19th century. Now it is no more restricted to anthropology or ethnology.

Life and livelihoods of the scheduled tribes of India is diverse in terms of their natural environment and 'built environment. Across centuries these ethnic groups developed, like any such groups in India have their unique skills and knowledge, bovines and bouts, food and fodder, beliefs and custom law, rites and rituals myths and legends, magic and religion, social institutions and associations, fairs and festivities, diseases, diagnosis and medicines, terms of address and terms of reference to kin and cousins, worldviews and cosmological understanding, music and dance dress and decorum, prayer and pantheon, care and share attitude, art and artifacts, customs and traditions, etc. However, most of mental and physical activities are conditioned by the biotic and abiotic entities of their habitat in micro ecology.

According to the 2011 census, the scheduled tribal population in India was 104 million, constituting 8.6 per cent of country's population. We have 705 different ethnic groups scattered across 30 States and Union Territories of India and having diverse cultural practices. In 2011, while 40.6 per cent tribal families were below the poverty line, the proportion among the rest was 20.5 per cent. In the health area, the key indicators among tribes remain very poor. For example, according to the National Family Health Survey 4 (NFHS-4) (2015-2016), the under-5 mortality among the tribal population was 57.2 per 1000 live births compared to 38.5 among others, and the infant mortality rate (IMR) 44.4 per 1000 live births versus others of 32.1. A child born to a ST family in India has 19 per cent higher risk of dying in the neonatal period and 45 per cent greater risk of dying in the post-neonatal period compared with other social classes. Conditions such as haemoglobinopathies and thalassaemia are unique and important health challenges for tribal population living, in particular, in the North-East, West Bengal, Odisha and Andaman and Nicobar Islands and Madhya Pradesh. Better understanding

of the problem including its management and control is critical. Glucose-6-phosphate dehydrogenase (G6PD) deficiency is also high in tribal communities-

In today's globalized and inter-connected world, India's population including those belonging to scheduled tribes (ST) is undergoing a rapid transformation in all frontiers of life and living. Technology contributed a lot. They are no more isolated as they were. However, the adverse impact of technology is that the modernisation has also displaced their traditional skill and knowledge to a remarkable stage. India has tribal communities of food gatherers and hunters, shifting cultivators, artisans, animal keepers, settled agriculturalist, and labourers, The skill of weather forecasting, protection of plants from insects. storage of seeds, preparation and preservation of raw and cooked food, water management system for irrigation, manufacture of different type of net and traps, restoration of soil fertility, treatment patterns for the bovines, medicine of herbal origin, etc are now in the process of extinction. A few senior tribal members still retain the traditional skill and knowledge. If it is not recorded now it can never be recorded. The creation of 5th and 6th Schedule of our constitution gave appropriate space for the communities *hitherto* subjected to exploitation and discrimination.

Nowhere the term 'tribe' has been defined in our constitution. However, our constitution has treated scheduled tribes as preferentially discriminated category of people. According to Article 366 (25) of the Constitution, Scheduled Tribes are those communities that are scheduled in accordance with Article 342 of the Constitution and extended many protective and promotive provisions in acts and schedule. The legacy of British colonialism is still there as a suffix to the term scheduled. They have been historically subjected to injustice for centuries by the successive rulers during colonial period and there after too. The prevailing situation in large part is due to the fact that scheduled tribe population has for centuries suffered from neglect from effective policy point of view. The scheduled tribal issues in India are many and to resolve these Govt of India has adopted a mix approach to integrate tribal communities successively by various measures:

- Constitutional protection for their land, culture, customs, language and manners. For this 6th Schedule mentions formation of autonomous district councils which can exercise legislative, executive and judicial functions on limited scope. Tribal advisory councils in 5th Schedule areas also give certain autonomy to tribal. Also, Governors have been empowered to amend laws for better applicability in their regard.
- Appointment of National Commission of STs which see the safeguards and implementation of schemes for tribes and backwards.
- Prevention of Atrocities on SCs and STs act which aims at protecting these people from encroachments and excesses of upper castes and non-tribal
- Reservation in legislature, government jobs and educational institutions for their welfare and promotion.
- Creation of separate states on language issues like Nagaland, Mizoram from Assam due to protests against enforcement of Assamese language
- Empowering and continuing army with special powers for safeguarding people in these areas from armed insurgencies.

- Forests act, Wildlife Preservation Act, etc. have recognised tribal right to their lands and forests. Supreme Court judgements have upheld tribal rights to sharing wealth arising out of their land.
- Scholarship, hostel, special schools, ambulance, hospitals, jobs in ST dominated areas.
- Tribal sub-plan to increase level of development in tribal areas.

With all said and done in favour of scheduled tribes in India have been unfairly treated and are victims of development agenda of governments and corporate world. There has been a loss of forest patches across decades. The northeast states are governed by 6th Schedule and the rest of the states with scheduled area and tribal population are governed by 5th Schedule whose supreme head is the Governor. Besides many provisions to undo historical injustice the rights and interest of scheduled tribes are being protected. The traditional rights to use resources along with their rights over ancestral forest and land as identified in their customary law and the habitat rights under FRA 2006. In development policy culture conservation and development has been given special attention to protect the interest of the scheduled tribes.

The Odisha Environment Congress (OEC) executive committee proposed the site and the broad theme of the congress in its last congress. The site selection by dignified members of last OEC in the last Congress - 2021 to have the 13th Odisha Environment Congress, 2022 with the theme "Environment and Tribes" at Central University of Odisha and COATS, Koraput has been a precise decision as many scheduled tribes inhabit in part of Odisha with their unique ecocultural adoptability. Sub themes; with the background of environment as the hallmark to discussion, the congress has devised eight sub themes for the forthcoming three day congress namely:

1. Indigenous Knowledge,
2. Tribal Art Culture and Literature,
3. Bio-Diversity Conservation in Tribal Areas,
4. Sustainable Forest and Water,
5. Mining in Tribal Areas,
6. Tribal Food Security and Livelihoods,
7. Climate Change and Tribes, and
8. Best Practices in Environment Conservation by Tribes.

Many scholars' activists, researchers responded to the call of the congress to present re papers. Many of the papers contributed for presentation in congress are empirical in nature and some are laboratory based experimental and a few are theoretical in orientation. My self and Prof. Sharat Kumar Palita have tried to edit the papers as quick as possible We rate almost all papers are good but due to paucity of time and space limitation in volume a few could not be accommodated.

Premananda Panda

*Editor, Proceeding of the
Odisha Environment Congress-2022*

Odisha Environment Congress: *A Committed Journey*

Look deep into nature, and then you will understand everything better.”

- Albert Einstein

Until mid sixteenth century human society was hovering over a gigantic question, “Whether sun revolves around the earth or the earth revolves around the sun?” It was in 1543 Polish Astronomer Nicolaus Copernicus answered the question in his book, “The Revolution of Celestial Sphere” in which he revealed that earth is not the center of the universe and sun doesn’t revolve around the earth. This led to the revolution in thinking of human civilization and to a changed world view.

The 21st Century is faced with another such giant question, “Whether ecology is the subset of economy or economy is the subset of ecology? Whether environment is part of economy or economy is the part of environment”? Our world view about relationship between economy and earth needs a shift like that of Ptolemaic Model of celestial system and the above questions must be answered with much urgency in the context of onset of climate change reality. This requires huge amount of research, dialogue, discourse, discussions and action, at various level and different places across the world. Odisha Environment Congress (OEC) is a humble attempt in this regard, in a small way, specific to Odisha context.

Started in 2010 as an annual scientific and civil society event on environment, OEC has been providing a unique opportunity to academicians, researchers, scientists, planners, policy makers, students, practitioners, community members and civil society organizations of the State and outside for learning, interaction and dissemination of knowledge on different themes around environment. It also provides scope for publication of theme-specific and research-based articles in the proceedings which is released during the main event, besides providing an opportunity for the professionals to present their articles in various technical sessions. The themes of last 12 years were “**Environment & Water Resources**” in 2010, “**Environment & Forest**” in 2011, “**Environment & Energy**” in 2012, “**Environment & Agriculture**” in 2013, “**Environment & Climate Change**” in

2014, “**Environment: Health and Nutrition**” in 2015, “**Environment: Water, Sanitation and Hygiene (WASH)**” in 2016, “**Environment & Sustainable River Basin Management**” in 2017 and “**Environment and Gandhi**” in 2018, “**Environment and Mining**” in 2019, “**Environment and Biodiversity**” in 2020, “**Environment and Pandemic**” in 2021. And the theme for 2022 is, “**Environment and Tribes**”.

In the last twelve years, scientists/researchers/experts of repute from all over India as well as Ministers and officials from the Central & State Government have participated in this event. Apart from 3 days long conference and paper presentations on the given theme of the year, there have been other activities which include competitions amongst school and college students, organising exhibitions, regional workshops, giving Young Scientist Awards, Green Corporate Awards, Green Ambassador Awards, and organizing Children’s Environment Congress etc.

13th Edition: Environment & Tribes

The life, culture and knowledge of the tribes or indigenous people are often embedded in a cosmology that consider nature as sacred and acknowledges humanity as a part of it. Their life and living encompass practical ways to ensure the balance of the environment in which they live, so it may continue to provide services such as water, fertile soil, food, shelter and medicines. The spiritual connections between tribes and the nature have been the cornerstones in safe guarding the ecology of the planet and preservation and conservation of environment.

But today their lives, survival, development chances, knowledge, health conditions etc are being threatened by environmental degradation, large scale industrial activities, toxic waste, conflicts and forced migration, as well as by land-use and land-cover changes. Over centuries the relationship between indigenous peoples and their environment has been eroded because of dispossession or forced removal from their traditional lands and sacred sites. Developmental projects, mining, forestry activities, agricultural programmes continue to displace the tribes from their lands. Environmental damage has been substantial, flora and fauna have been extinct or endangered, unique ecosystems have been destroyed and rivers and other water bodies have been severely polluted. Along with these challenges climate change phenomena is further going to exacerbate which heavily impact on the balance between tribes and environment.

The 13th Edition of OEC on “Environment and Tribes” provides the scope and an opportunity to scientists, researchers, activists, environmentalists, tribal leaders, academicians to discuss, deliberate and come up with workable solutions to meet up the above challenges. We are happy to note that 79 authors/researchers have contributed articles on different sub-themes around the focal theme, “Environment and Tribes” which have been published in this Conference Proceedings. Apart from paper presentations in different technical sessions, live art exhibitions, cultural programmes, giving away of awards like S B Mishra Green Corporate Award, Padmashree Radhamohan Green Ambassador Award, Padmashree Ajay Parida Young Scientist etc. Children’s Environment Congress 2022 is another flagship programme of OEC which is being hosted by Council for of Analytical Tribal Studies (COATS), Koraput in which students will take part in different kind of activities around the focal theme.

Till 11th Edition of OEC, we used to organize the OEC at Bhubaneswar in Regional Museum of Natural History (RMNH). In 2021 we expanded the OEC beyond Bhubaneswar and organized it at Balasore in partnership and collaboration with FM University. This year Central University of Odisha, Koraput is hosting the annual event as the partner and collaborator. The Organising Committee of OEC expresses its deep sense of gratitude to the Vice Chancellor, Dean, Faculty Members and other employees for their support and cooperation to make it a success. The members of the local organizing committee including Director, Co-Director and staff members of COATS have taken the initiative to organize the OEC and Odisha Children's Congress in a grand way. Our special thanks to them. We also thank all the partner organizations like Centre for Environment and Development (CED), Thiruvethapuram, Hdf-cDAR, RMNH, S 'O' A University, Odisha Environment Society for their cooperation without which this event would not have been possible. The editorial board members have put enormous effort to bring out this conference proceedings. We acknowledge their effort with deep sense of gratitude. We also extend our thanks to all the sponsors who have contributed for the success of the OEC.

In last two years, many of the stalwarts in the field of environment conservation who were associated with us from 2010 have left us for heavenly abode. They include Prof Padmashree Radhamohan, Padmashree Ajay Parida, Bhagirathi Beherea and very recently Ambassador Abasara Beuria. We deeply mourn their sad demise and pledge to carry forward their work with best of our effort for the cause of environment.

Sudarsan Das
Organising Secretary

Dhiren K. Ray
Chairman

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Fishery and Tribal Livelihood: An Insight with Reference to Koraput, Odisha

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INTRODUCTION

Fisheries and aquaculture is one of the fastest-growing industries in the World (Tacon, 2020) and has been playing an important role in the economic development front on account of its contribution to food and nutritional security, national income, employment opportunities as well as generating livelihood options (Kumar and Shivani, 2014). From the time immemorial, fishes were considered as a primary source of animal protein for making it as an integral part of diet for billions of people Worldwide (Azim et al., 2012). It makes up more than 6% of the world's annual animal protein supplies for human (Pauly and Froese, 2012; Mariz et al., 2020, Baran et al., 2007, Briones et al., 2004).

Freshwater fisheries provide food and a livelihood for millions of people around the world and more particularly capture fishery and aquaculture serves the livelihoods of more than 10% of the global population (Anonymous, 2020b). Fisheries and aquaculture supplies not only dietary essentials for human consumption, but also provides excellent opportunities for employment and income generation, especially in the more economically backward rural areas (Jayasankar, 2018). Fisheries or fish capturing forms the primary origin of income for the rural people (Gogoi *et al.*, 2015) especially those residing adjoining to waterbodies (Kamruzzaman and Hakim, 2016) accounting for 15% of global remuneration by providing full time and part time employment (Azad, 2015) which in turn again supports the country's economy, employment generation, poverty alleviation as well as foreign exchanges (Alam, 2005). In India it is estimated that 12 million people are directly engaged in fishing and about 60 million are exclusively dependent on it for a living (Manasi et al., 2009).

India currently ranks 3rd in fisheries and 2nd in aquaculture production in the world, contributing 6.3% to the total global fish production (Anonymous, 2020). Among all the states, Odisha deserves special mention as one of the major fish producing states and ranks 4th in total fish production in India after Andhra Pradesh, West Bengal and Gujarat. The total fish production of Odisha during 2017-18 is estimated to be 0.685

million tonnes (Ngasotter et al., 2020) and the export income generation is around 31,000 million during 2017-18 (Anonymous, 2018).

India's freshwater resources consists of 195210 km of rivers and canals, 2.9million hectors of minor and major reservoirs, 2.4 million hectors of ponds and lakes, and about 0.8 million hectors of flood plain wetland and waterbodies (FAO, 2006). Freshwater fishing contributes 800,000 tones which is 13% of total fishing of India 2007 (NFSO, 2007). Fishing, defined to be the process of capturing all aquatic animals (Sreekrishna and Shenoy, 2000) by using different gears, constitutes an age old and indispensable livelihood for the human race from the time when they used to be food gatherers (Bose et al., 2017). Tribal habitant and rich primitive culture covers many traditions and Fish is an integral part of tribe food habit since time immemorial for the region (Mundy and Crompton, 2011).

Fish is the important source of protein for the tribal communities (Pauly and Froese, 2012; Gupta, 1980; Sreekrishna and Shenoy, 2000) and they have developed various traditional practices for fish capturing. Traditional fishing techniques varies considerably in detail from region to region, but an analysis of the range of techniques employed show that the techniques and tools used depend on the type of habitat being exploited (Kharat et al., 2013). Various traditional fishing practices are being used in the country including ichthyotoxic plants hand picking, nets and baskets made are of various natural materials (Lalthanzara and Lalthanpuui, 2009). Documenting such knowledge may help communities undergoing similar change in their environment and ensure food safety for them (Kharat, 2013; Nightingale, 2013; Tynsong and Tiwarin, 2008).

Community fishing practices have been reported some authors (Dutta amd Bhattacharya, 2008). It has been observed that there is good documentation of traditional fishing technique has been made from north-east states of India. Pradhan et al. (2011) described various traditional fishing techniques of Tribes of Bastar Region of Chhattishgarh. Karat et al. (2013) describes the traditional fishing techniques of *Katkari* tribe of Tamhini region of Western Ghats, Maharashtra. They described the techniques as sustainable method of fishing which does not harm the local biodiversity. The study also revealed that that *katkari* in this area are quit conscience to protect their biological resources and practices sustainable fishery. Rasal et al. (2021) described fishing techniques of Gond, Patel and Burman communities around Bargi Reservoir, Madhya Pradesh.

In the present study, an effort has been made to understand fish and fishery resources of Koraput of Southern Odisha and traditional fishing practices if tribes of the region.

FISH AND FISHERY IN ODISHA

India is rich in ichthyofaunal diversity having 1027 species (Gopi et al., 2017). Odisha, an eastern state of India contributes about 13.92% to the freshwater fish fauna of India (Dutta et al., 1993) and around 186 species of fish (Mogalekar and Canciyal, 2018) have been recorded from the state. Odisha sanctifies with 525248 ha of freshwater resources i.e. reservoir or barrages (189972 ha), tank or ponds (29301 ha), 2582 km rivers or streams (223522 ha; Mahanadi, Brahmani, Baitarani, Rushikulya, Vansadhara, Nagavali, Kolab, Indravati, Bahuda, Subarnarekha and Burhabalanga), waterlogged (natural; 13859 ha), riverine wetland (980 ha), oxbow lakes (728 ha), lakes or ponds (712 ha), wetland