UNLOCKING THE SCIENTIFIC AND UNSCIENTIFIC DEBATE IN COMMUNITY FORESTRY

Experiences from the state of Orissa…

The knowledge of local forest protecting communities has largely remained unnoticed by the forest department and forest laws in India. The efforts of such communities in managing forests have rarely been acknowledged. Forest management arrangements as prescribed by the forest acts and laws till date is restricted to management of forest as providers of forest produce; both timber and non-timber. Contrary to this, for communities depending on it, forests are more than a resource, it defines their identity and heritage. These communities with a long-standing history of their relationship with forests have developed institutional arrangements, rules and regulations to manage their resource. This paper makes an effort to investigate the extensive indigenous knowledge of people in this regard and favours the tenet that practices followed by communities have scientific validity and can be proved at par with scientific forest management practices as prescribed by the forest department. In enlisting such people's knowledge, this paper aims to create space in the existing policies and laws for forest protecting communities.

It is common knowledge of communities that forests are intricately connected to their livelihoods; they provide timber, non-timber forest produce and a host of non forestry services- climate control, water recharge, fertility and nutrient balance etc. Since long several communities across the world have been engaged in sustaining forests irrespective of the tenurial status. Despite this, scientific knowledge has remained central to forest management system. The history of Indian Forestry argued strongly in favour of the benefits of scientific forestry and scientific supervision and management of forest. Often self initiated forest protection and management practices have come under severe criticism. Debates have been raised on the technical and ecological validity of their practices. In recent decades, with the growing realisation to decentralise natural resource management system and steady increase in the number of success stories in participatory forest management practices across the globe, academicians and policy makers have started taking note of the efforts of the self initiated forest protecting communities.

The National Forest Policy of 1988 for the first time mentioned enlisting community participation in forest management. The June 1990 Joint Forest Management (JFM) guidelines of the Ministry of Environment and Forests (MoEF), provided space to include communities in the process of management but allowed them to operate only within certain restricted limits. This in a way contradicts the principle of CPR management, as opined by Ostrom Firstly, the external agent in the management processes here i.e. the forest department is itself a user of the resources. As per the provision in JFM the benefit of the resource is jointly shared among people and the forest department. Secondly, and most importantly, in this programme the external agent has imposed the set of governing principles, completely ignoring people's knowledge at it. A blue print of forest management system that has to be in place is handed over to the communities in a JFM arrangement, which besides ignoring

community knowledge also creates a dependency in the community. Thus such systems only further the degeneration of people's institution.

It can be reasonably argued that traditional ecological knowledge possessed by the communities could be an extremely useful tool not only in involving them in forest management but improving their general economic condition and ensuring the long-term sustainability of forest management in the area.

This paper attempts to corroborate the scientific validity of traditional forest management practices. The arguments put forth in this paper have drawn its strengthen from the forest protecting communities of Orissa, the bearers of extensive local ecological knowledge.

This paper enlists some of the practices followed by communities in managing forests. It proceeds to present these practices in comparison with that of the scientific practices as prescribed in the forest acts and working plans that largely guides forest management practices in India today. The paper concludes with a brief note suggesting the role to be played by science in forest management and role to be played by all agencies working on forestry issues in imparting such knowledge to communities involved in forest protection and management.

The data and cases referred in this paper are taken from several villages of Angul and Dhenkanal districts of Orissa (India) where one comes across strong presence of near about 3000 forest protecting communities. All the villages from where data have been collected have miscellaneous forests and are mainly populated by the '*chasa*' (agriculture dependent communities) caste people. Semi-structured interview with an unstratified sample of household in each village, individual and group discussions with villagers has provided data for this paper. The interviews and discussions mainly aim at exploring people's knowledge in forest management and are mainly restricted to the four areas namely;

i) Choice of species-based management
ii) Timber-based management
iii) NTFP-based management
iv) Preventive action-based management

A lot of references have also been taken from village resolution books where people have recorded the decisions taken and proceedings of their village level meetings.

There are certainly many other areas of forest management that do not come under the purview of this paper. This paper only serves as a base line for future qualitative research work in this area.

History of Forest Management:

Before presenting the practices followed by the communities it will be worth mentioning the role of science in forest management and how over a period of time scientific principles have guided the design of the forest management system in our country. A glance at the Indian forest history clearly presents some straight facts.

They had served a commercial and a strategic purpose since pre-colonial times. Since the times of colonial rule the forests in this country have been primarily viewed as a major source of earning revenue to fill the State coffers. Forests were utilised as bases for socio-economic and political initiatives. The idea of having a formal structure of the government to manage forest resource therefore became essential to look into such interest of the State.

Here it would be interesting to note a couple of arguments that have been put forth regarding the necessity to have a State owned forest department to manage the forests. **J.W. Nicholson**, who served as a provincial research officer during the colonial period, was of the opinion that the forest department came into existence due to two main reasons. Firstly "*forests require protection from men, as it is a common failing in human nature that whenever any product is found in abundance its use is abused without thought for the future. Left to themselves, the villagers take no care of their forest."* He cited the reason for steady forest destruction in the world as an example of such attitude on the part of human beings.

His second argument justifies the necessity to have a forest department on the basis that *the management of forest is a 'complicated science', which takes years of training and experience to learn. Therefore it's essential to have a forest department consisting of men who have been thoroughly trained in the science of forestry*. So for Mr. Nicholson it was sufficiently evident that where government is the 'fortune owner' of forests it must protect those forests from the thoughtless act of the ignorant villagers who would otherwise destroy the forests with dire consequence for future generations. Like him there were several others who argued in favour of forest management through a State owned forest department who would have technical expertise in managing such resource. They even contended the necessity of 'reserved forest' to protect them from hazardous private interests of local people.

Contrary to this many like R.C.Guha, Madhav Gardgil and Vandana Shiva have argued that all these forest policies led to more deforestation and these policies manipulated the customary use of forests to enable sustained timber production fulfilling the commercial and strategic interest of the State. These systems of forest use and management led to more ecological decline. These scholars are of the opinion that the forest policies of India have resulted in alienating the communities from their forest resource and have deprived them of the right to manage the forest according to their own knowledge and requirement.

The scientific management of the forest, which started in 1964, and the first working plan to manage the forests in India, which was developed around 1870s, remained silent about the role of the communities in forest management. The first Forest Policy in 1894, classified the forest resource into four heads and laid down general principles to manage forests. Following independence the National Forest Policy of 1952 came into being. This policy also classified forests into four categories and stated that the functional classification of forest is required to design specific management plan as per the condition and objective of management for each categories. But it remained silent about the management plan. Working plans developed during this period incorporated the essence of this policy and considered

forests as a subordinate to the development requirement of the nation and a source of revenue for the State. Till the 80s forest management system remained almost same with slight modification here and there but the essence remained unchanged.

Present scenario:

The National Forest Policy, 1988 made some attempts to set right the misplaced focus of the erstwhile Forest Policies. Forest conservation as a component of forest management got its first recognition and working plans found their place under the state forest management plan and it was made mandatory that no forest would be managed without government approved management plan. Working plans that came after 1988, therefore, give importance to the conservation of forest along with people's involvement in forest management. The Government of India's resolution of June 1990 on Joint Forest Management, which claims to aim at active involvement of the people, can be seen as recognition of people's effort in forest management. In the Government of India guideline (dt.21st February 2000) the Ministry of Environment and Forest, have acknowledged the existence of self-initiated forest protecting communities and have asked the states to make special provisions for these in the existing framework of law.

The state government of Orissa is yet to take any steps in this regard. As for them, the mindset is still that the forest department is the owner of the forest resource in the state. People are allowed to access limited tracts of forest and resource as a mere concession and they in no way possess any right over the forest resource. Any provision to include local people in sharing of forest resource would have an adverse impact on the health of forest as they do not have any technical knowledge of managing forest. They still firmly believe in the argument that left to people they cannot manage the forest 'scientifically'

Community Forest Management:

Over the last couple of decades the steadily declining forest cover have manifested its direct impact on the life form on earth and therefore, cannot merely be viewed as a resource to be extracted regularly without any checks what so ever. Responding to the growing deforestation and the resulting short supply of forest resource essential for their survival, people across several states of India have organised themselves to protect and manage their forest resource. It is estimated that about 10000 such people's institutions are currently involved in protection, conservation and management of forest, majority of, which are self-initiated. They have set up their own rules and regulations specific to the socio-politico, economic environment of their villages, and their own institutions in which elements of their tradition is clearly reflected. As a result of these communities initiatives they have helped in regenerating about 1.5 million hectares of forest, which accounts for 8% to 10% of the total forest cover (NRI report).

Herein it is important to point out that such initiatives at community forest management are not a recent phenomenon but have been in existence since long. In recorded history we have instances of communities protecting and managing forests since the last four-five decades. These community forestry initiatives primarily emerged as a response to the scarcity of forest resources, which has arisen due to degradation and loss of forests. These initiatives are aimed towards a more judicious use of forests to ensure sustained flow of forest produce, either for subsistence or for cash flow. But the access of local communities to forest was severely restricted when the forest was brought under the State administration in the name of scientific management.

Observations and inferences

In this context therefore it becomes essential to know the validity of such an argument as to whether the practices followed by the communities while managing forest have any scientific value or not? Whether the knowledge possessed by the community matches with that of the prescribed practices of Working plans or not? In India since 1865 forest working plans has been the basis of forest management, which are based on silvicultural principles. In the following part of the paper some of the practices followed by communities would be presented along with the practices that has been prescribed by the working plans to discern the similarities and differences. *In doing so it is not aimed at challenging the value of scientific principles in forest management but it merely tries to establish that some practices followed by the communities are in consonance with scientific principles and therefore their role in forest management cannot be dismissed on that account.*

People's practice:

Choice of species-based management:

Dependency:

The Forest Conservation Act (1980) and National Forest Policy (1988) recognised the importance of managing the forest resource on principles commensurate with the people's requirement and environmental concerns. In principle it also recognises people's understanding of their dependency on forest resource.

The dependency of forest dwelling/dependant communities on forest for subsistence and livelihood hardly needs any elaboration. Communities are keenly aware of the role forests play in their lives. Forests conserve water and ensure its availability, arrest soil erosion and thereby preserve valuable topsoil to grow crops, house to many animals and several other living beings who are part of the ecology. Besides this, from fuel wood to timber for agricultural implements, for the household, to minor forest produce, communities have depended on forests and have known its value, beyond simply as a provider of revenue to the State. At times the fruits, leaves and tubers obtained from the forest spells the difference between starvation and life for many of them. It is been this dependence, of livelihood niches, of identity,

that forests have given people, that we have many communities involved in managing, protecting and sustaining their forests through their own understanding and wisdom that stems from their varied interactions with the forests.

Maintaining Diversity:

In the working plans there is classification of species into primary and secondary categories. As per the "coppice with reserve system" of the working plan in Angul circle the list of primary species consists of *Shorea robusta* (sal), *Pterocarpus marsupium* (piasal), *Ougenia oojeinensis* (bandhana*), Gmelina arborea* (gambhari), *Terminalia alata* (asan) etc. which are viewed as important species due to their utility, value and demand in the market. All other species fall into the category of secondary forest and the working plan is silent about their management.

The forest department over a period of time is been engaged in growing trees that earn maximum revenue and therefore the thrust is on plantations of species of higher market value to be harvested for meeting market needs. This sometimes leads to the plantation of single species, which even threatens the biodiversity of that region. Revenue being the primary concern of forest management in the State for a long time, the guiding motto of the working plans is bound to give market needs an edge over the needs of the local communities. The selective felling system practised by the forest department often leads to maintenance of single species forest. Therefore in such scientifically managed forests most often one only sees a predominance of species like *Tectona grandis* (teak), *Shorea robusta* (sal), *Acacia auriculaeformis* (acacia), *eucalyptus*, *Cassia siamea* (chakunda) and other such varieties. As there is no specific management plan for the secondary species, such forests are systematically removed to make way for revenue earning species, which spells a dangerous pattern, displacing livelihood niches of many forest dependent communities.

In community forest management people are concerned with not destroying the forests and at the same time being able to meet their varied daily needs. Therefore people protected forests have a wide-ranging diversity in terms of species. Infact the wood use pattern in many villages ensure diversity because that is the very backbone of their dependence and at the same time balances the intricate web of life.

For instance, in the two districts where the study is conducted, to make a **bullock cart**, which is an essential component of rural economy, people have been using timber from trees like *Dendrocalamus strictus* (bamboo), *Shorea robusta* (sal), *Ougenia oojeinensis* (bandhana), *Dalbergia sissoo* (sisoo), *Choloroxylon swietenia* (bheru), *Gmelina arborea* (gambhari), *Buchanania latifolia* (chara), *Anogeissus latifolia* (dhaura), *Diospyros melanoxylon* (tendu) etc. Instead of using any one kind of species as many as 19 species are used that is best suited for particular purpose and all this is based on a system of knowledge that has got validity over the years through use and experiences. Even to make the simple "**dhenki**"[2] a combination of 7 species is used. The various parts of dhenki are prepared by using timber mainly from *Schleichera oleosa* (kusuma), *Diospyros melanoxylon* (tendu), *Azadirachta indica* (neem), *Acacia leucophloea* (gohira), *Bridelia retusa* (kasi), *Choloroxylon swietenia* (bheru), etc. depending upon the availability of such species in their forest.

Similarly for fuel wood the usual practice that prevails in several villages is to use variety of species like *Cleistanthus collinus* (karada), *Lagerstromia parviflora* (sidha), *Combretum decandrum* (attendi), *Ougenia oojeinensis* (bandhana), *Nyctanthes arbortristis* (gotikharika), *Choloroxylon swietenia* (bheru), *Adina codifolia* (kuruma) etc.

The usage patterns followed in several villages are an indication of their consciousness towards species selection and not blindly using one species. There is also no practice of selecting species depending upon their market value; rather species that are of their use are the ones, which find a place in people's protected forest.

Timber-based management:

Species with high coppicing should only be regularly harvested is the practice that is prescribed in the working plan. It suggests for marking of exploitable size trees by selection, retaining the good seed bearing trees that would help in future regeneration. To meet the local needs provision of using only dry and dead wood is there. The specification regarding timber size is that timber that has grown to anything between 45c.m and 60c.m. diameter should only be extracted for fuel wood purpose and 60cm. to 90c.m. should be used for non-fuel wood purpose. Silvicultural management practices of the working plan also suggest that only those bamboo clumps should be used which are two years or more old and have a diameter varying between 15cm and 45cm.

The many species considered as primary species as per the list provided by the working plans have been found to be protected by communities and are brought to use only on special occasions, like natural disaster or social functions, after taking a collective decision on its use. While in several community forest management systems the rule of collecting only dry wood exist they also ensure that plant species that show early regeneration are the only ones that are encouraged to be harvested for meeting the needs of the people. These kinds of tree species showing high rates of coppicing even if they are cut do not exert any great pressure on the forests in terms of any regional ecological imbalances. Barring such species there are defined rules among many communities across the state on harvesting any particular species totally from the forest.

The practice of specifying diameter of the timber to be used is also prevalent in some communities managing forest. It was found in some villages, trees with diameters ranging between 30cm and 60cm are mainly used for the purpose of stump/pillar.

In case of bamboo people extract bamboo that is two to four years old or even more with lengths that vary between 8 meters and 11 meters and diameters ranging between 10c.m. and 30c.m.

The prevalent practices when matched with the scientific silvicultural principles as mentioned in the Working Plans establish consonance.

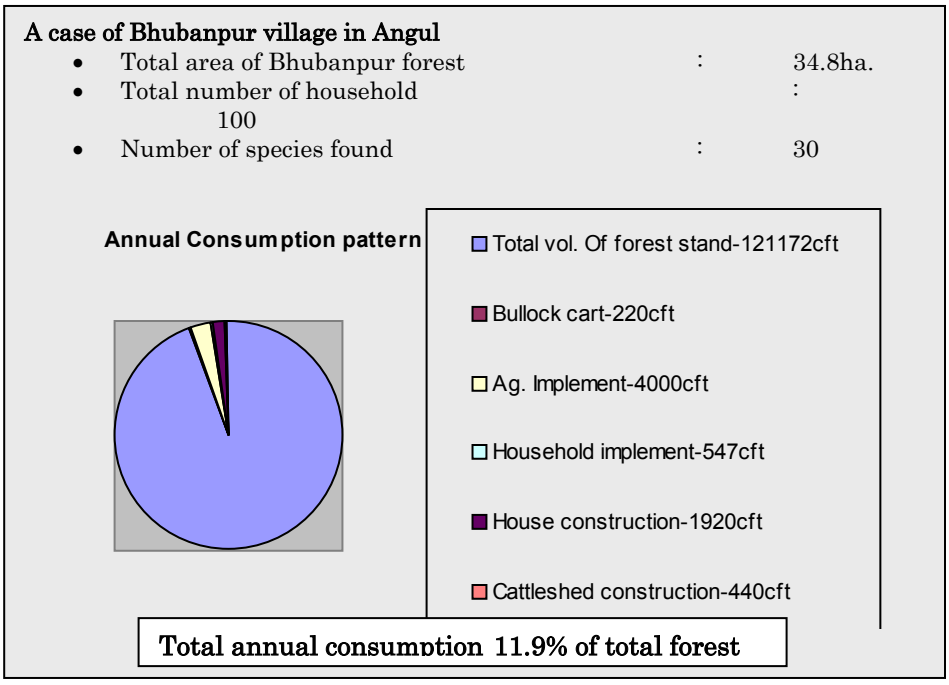
Extraction limit:

The working plans have suggested different extraction limits for different forests. While it ranges between 30% to 50% of the mean annual increment for a good *Shorea robusta* (sal) forest, it is 10% to 15% for a mixed forest. However such extraction limits are dependent upon factors like species diversity, species density, regional resource base, climatic zones etc.

For fuel wood purpose, which is seen as a major dependency of the local people on their forest, the declining forest resource in the last couple of decades have forced people to explore alternative sources to fulfil their needs. The study conducted in a couple of villages in these two districts reveals that people collect 40% of their fuel wood requirements from the herbs, shrubs, woody climbers, dead and diseased plants, palm and dry leaves, used bamboo, etc., 20% from their personal plots, having good varieties of coppicing trees & palm branches and only rest 40% from their forest.

Further, in making their agricultural and other household implements people use species that have greater durability thereby reducing timber demand from their forests.

For example in the case of Bhubanpur, which is cited here, though the mean annual increment of the forest is not taken into account but the diversity of species available, the coppicing capacity of several species and wood use pattern of the people in the village is in tune with some scientific value for which the system of extraction has not affected the health of their forest.



NTFP-based management:

Working plan suggests that trees yielding minor forest would not be marked for felling unless dead or fallen.

One would come across practices of communities prohibiting cutting down of species like *Diospyros melanoxylon* (*tendu*), *Madhuca indica* (*mohua*), *Shorea robusta* (*sal*) etc. The main reason being non-timber forest products of such trees serves as livelihood support mainly to the poor and landless families. The presence of such species in abundance in sacred groves of the Angul and Dhenkanal district area speaks volumes of people's knowledge about the importance of such species and the kind of value they attach with such species.

Preventive action-based management:

Grazing and forest fire:
As per the working plan there is strict restriction on grazing in the forestland during the rainy season and there are specific measures suggested for combating problems like forest fire by creation of forest line, slash and debris disposal before the commencement of summer season etc.

In villages there are specific areas that are allotted as grazing land for the livestock of the village, though sometimes as per rules framed by the village there are provisions to allow grazing in the village forests when other sources of fodder have exhausted. In many villages there is also prohibition on grazing during rainy season as that is seen as the time when natural regeneration process is in full swing.

Further in order to prevent forest fires there are rules in some villages that have been framed that make provisions for fire lines and the removal of dry leaves from the forest in the summers when most fires break out in the forest. Also people have rules that make it mandatory for all villagers to finish all their cooking and other fire related activities by 9:00a.m or at some places 10:00a.m to minimise any risk due to fires.

Institutional Arrangement:

All the points raised above presents a strong case that prove that the traditional practices in forest management and protection also hold true as per the scientific silvicultural principles of management as laid down in the working plans and at times even prove to be a better practice (mainly when it comes to maintenance of species diversity). But it raises a doubt about their acceptance and actual implementation at the community level. Therefore, here it would be essential to discuss a little about the institutional arrangements that are in place in the community forest management system, which are responsible for the implementation of all practices that are referred to in the paper. Unlike the forest department which has a well defined administrative structure and a codified set of laws and principles to guide them in forest management, in several villages it is mainly the traditional village body of the elders, who with a set of largely oral rules and principles, determines the forest protection and management system.

In Orissa there are several communities that have successfully on their own initiatives, based on mutual understanding and co-operation among neighbouring

villages, managed and sustained their forests and have been able to ensure rich forest cover over hundreds of hectares of land. Many of them have been protecting and managing forest patches in their neighbourhood through community vigilance and by evolving institutional arrangements for patrolling and restricting access and regulating use of forest. In some villages one has the *"thengapalli"* [1] system of protecting while in some others the village collects money from each of the households to be given as payment to the hired guard for the forests. There are yet other instances, wherein forest boundaries are clearly demarcated between villages sharing a patch of forest and each of them is informed of the rules and regulations of the neighbouring village. Within the village too everybody is informed of the rules and regulations of use which are arrived after thorough discussion among all villagers, and together they are able to counter external threats to their forests.

However, all individual members of the village are made responsible for the resource protection and in turn all of them enjoy equal rights over the resources. After taking the stock of the resources available, the decision to extract it is usually arrived after a series of discussion among all members. In those discussions efforts are made to strike a balance between the carrying capacity of their forest and the requirement of the members. But usually the carrying capacity of the forest is given more importance than the members' requirement while deciding the extraction limit of various species. The argument that is given for arriving such a decision is that they want to meet their needs in the following years also, instead of fulfilling it only in one year. The carrying capacity of forest is calculated on the basis of species available, their size, their coppicing capacity and their demand among its members. In case of bamboo and other timber species people's age old practice guides them in deciding their maturing stage.

Here one can always argue that in the absence of a scientific method to reach to the practices that are followed by the communities in managing their resource, it can be a mere coincidence that some of their practices are found similar or in tune with that of the prescribed scientific practices. But then who decides what is scientific and how does one justify the practices mentioned in working plan as scientific? All of these practices ascertain their status of being scientific only on the basis of they being effective in maintaining the ecological balance. Now looking at the practices followed by the communities and their established institutional arrangements it would be difficult to ignore the role that they play in maintaining the ecological balance of their region.

Areas of concern:

However while arguing for community-initiated protection and management practices, one is not ignoring that, there are several grey areas of concern where the communities have not succeeded in their attempt to manage their resource effectively. There are a lot of factors that hinder such processes, for instance intra and inter village strife often sees the forests at the receiving end of people's vengeance; often simply used driven practices without any sort of regulations sees certain particular species threatened and sometimes the adverse effects of climate changes drive people to the brink of destroying the very resource that they might have conserved in the past years. Lack of awareness among people are largely

responsible for such situations. There are also many areas of forest management that has remained unattended by the communities owing to their lack of knowledge in those aspects.

The realisation:

To maintain ecological balance and the intricate web of life it is not just essential to have a mixed forest with diverse species but at the same time one that meets the varied needs of the people depending on it. Community forest management practices have shown to be giving equal importance to ecological requirements as well as cultural and livelihood needs that a forest ecosystem ensures, thereby well integrating forests into the social fabric of the community.

All the above instances are some proof of the initiatives taken by communities over a period of time to manage and protect their forest resource, which have a scientific temper, as per people's wisdom. The reason behind it is simple: communities that dwell in or depend on forests do not see forests merely as a resource to be continuously reaped and harvested. Rather for them forests ensure the year round availability of roots, tubers, fruits, medicines and a perennial source of water; it keeps their agricultural lands fertile by arresting soil erosion in the upper reaches. Forests are intrinsically linked to their lives and livelihoods and have thus become the sociocultural heritage of many communities. If one sees it in contrast to the argument put forth by Nicholson that forests requires protection from people and it require years of training and experience to manage forest scientifically, people's practices and their long association with forest management would then qualify them to play more active role in the forest management.

But while arguing for the community forest management system, one is not trying to ignore the role of science to be played in forest management. There are several areas of forest management like flora and fauna interaction, regulation of yield, biodiversity interlinkages etc. that requires scientific research. Institutions and agencies having such knowledge in forestry science have a great role to play in extending the knowledge base to the local communities, thereby strengthening communities' practices. Forest department can also play a more constructive and meaningful role in looking into the adherence of a set of principles of forest management based on scientific value by the communities. It can also become instrumental in generating awareness and making contemporary knowledge and research available to the people, instead of imposing newer forms of institutional and management arrangements, which are already in place.

To conclude:

The most powerful government cannot rule the governed without their co-operation. To be effective the government must elicit compliance from the governed. For this to take place community forest management initiatives has to be given recognition by the State. To strengthen the systems of management and protection all concerned stake holders should be brought to a common platform to be able to evolve policy guidelines that recognise the rights of the people in management and protection, those not only do away with the existing loopholes but also frame guidelines along ecological principles.

Today there's a growing awareness in the collective consciousness of the society about the need to have a secure ecology. The communities of Orissa on the other hand have, since decades realised this and have evolved ways to maintain their regional ecological security – let us strive towards strengthening these systems/institutions, making them dynamic and vibrant, ones that are not frozen in the contours of time and space.

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Notes:

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1- **Thengapali**: It's a forest protection system that is in practice in many villages of Orissa where a stick (called *thenga* in local language) is handed over to every household who is in charge of protection for that particular day, in a rotational basis.

2- **Dhenki**: It is a wooded crushing machine used mainly in villages of Orissa for grinding food grains.

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