

Source Book
for
Functionaries in Tribal Areas

7

Natural Resource Management and Biodiversity



Tribal Welfare Department, GoAP, Amaravati
Centre for Innovations in Public Systems, Hyderabad
University of Hyderabad, Hyderabad

2018



Source Book
for
Functionaries in Tribal Areas
Volume 7
**Natural Resource Management
and Biodiversity**



Editors
Prof. BV SHARMA
Prof. N. SUDHAKAR RAO

Associate Editor
Dr. K. KOTESWARA RAO

Tribal Welfare Department, GoAP, Amaravati
Centre for Innovations in Public Systems, Hyderabad
University of Hyderabad, Hyderabad

2018

Overall Coordination

Shri C Achalender Reddy IFS

Director, CIPS
ASCI, Hyderabad

Coordination Team (CIPS)

Mr. KV Subbareddy, Consultant
Dr. Sipoy Sarveswar, Project Officer
Mr. Ch. NV Ashish, Project Research Associate
Ms. Zenia Taluja, Project Research Associate
Mr. Mohammed Ahmed, Project Research Associate
Ms. Deepa Das, Project Assistant
Mr. T. Manish, Project Assistant

Coordination Team (TW)

Office of Director, Tribal Welfare, Vijayawada
Mission Director, TCR & TM, Visakhapatnam

Coordination Team (UoH)

Mr. Mariakumar Mathangi
Mr. Dalibandhu Pukkalla

Technical Coordination

Shri Vadrevu Ch. Veerabhadru
Advisor, CIPS

© Centre for Innovations in Public Systems, ASCI, Hyderabad

Layout Designed & Printed by
Samantha Graphics, Vijayawada & Hyderabad

Contents

Acknowledgements *vii*

Editors' Note *viii*

Unit 1
**Community and Natural Resources for Tribals and
Their Management** **1**
Alok Pandey

Unit 2
**Role of Socio-Cultural Elements of Tribal Life in
Forest Conservation** **13**
T. Appa Rao

Unit 3
**Indigenous Knowledge of Tribals on Forest Products
and Bio-Resources** **23**
K. Koteswara Rao

Unit 4
Forest Policy and Forest Laws **40**
K. Anil Kumar

Unit 5
Involving Tribals in Forest Management **56**
D V Deshpande and Sridhar Bhallamudi

Unit 6
Managing Man - Animal Conflict in Tribal Areas **70**
T. Appa Rao

Unit 7
Biological Diversity Act 2002 **82**
P. Sravanthi

About the Unit Authors

Alok Pandey is Dr S Radhakrishnan Postdoctoral Fellow (UGC) in Humanities and Social Sciences. He had earlier taught Anthropology (ad hoc faculty) at the University of Hyderabad, Telangana. His research interests include ecology, biodiversity conservation, natural resource management, development, nomadism, and pastoralism. He has carried out fieldwork with the nomadic pastoral Van Gujjar in the Himalayas and the pastoral Toda of the Nilgiri hills of South India. He has also worked as Consultant to the National Commission for Denotified, Nomadic and Semi-nomadic Tribes (NCDNT&SNT), Ministry of Social Justice and Empowerment, Government of India.

Apparao Thamminaina (Ph.D., University of Hyderabad) is working as an Assistant Professor (Anthropology) in the National Institute of Technology, Rourkela, Odisha. He had earlier served as an Assistant Professor at the Tata Institute of Social Sciences and as Guest Faculty at the University of Hyderabad. His primary research area is tribal development with a focus on the Particularly Vulnerable Tribal Groups (PVTGs) of Andhra Pradesh, Telangana, and Odisha. He is a Co-coordinator for the Centre of Tribal Studies (Sponsored by Ministry of Tribal Affairs) at National Institute of Technology, Rourkela. He has completed a few projects on tribal development and NTFP management. He has presented several papers on tribal issues in various conferences and published a few of them.

Dr. K. Koteswara Rao is Dr. S. Radhakrishnan Post-Doctoral Fellow at the Department of Anthropology, University of Hyderabad, Hyderabad, from where he received his M.A., M.Phil., and Ph.D. degrees. Earlier, he worked as Senior Research Fellow for the High Level Committee on the status of tribal communities of India, Ministry of Tribal Affairs, Government of India; Post doctoral researcher in the Indian Institute of Science Education and Research (IISER) Mohali, Punjab; and Guest Faculty at the University of Hyderabad and Pondicherry University. His research interests include: indigenous knowledge and its management; development-induced displacement, resettlement and rehabilitation; and tribal and rural studies. He has published many research papers in the international journals of repute.

Dr. Anil Kumar K is serving as Assistant Professor in the Discipline of Anthropology, School of Social Sciences, Indira Gandhi National Open University, New Delhi. He obtained his M.A. M.Phil. and Ph.D. degrees in Anthropology from University of Hyderabad. His research interests are Culture and Environment, Indigenous Knowledge System, Natural Resource Management, Health & Nutrition, Development-induced Displacement, Resettlement and Rehabilitation, and Tribal Studies. He is the author of two books. He has also published good number of research papers and articles in Journals and edited books. He has actively associated with major and minor research projects and surveys with EPTRI, NIN, FHI, IPPG, UGC, DFID and Jamsetji Tata Trust. Prior to joining IGNOU he had worked as Assistant Professor at the Center for Economic and Social Studies (ICSSR Institute), Hyderabad.

Dr. D V Deshpande is Director of Bankers Institute of Rural Development (BIRD) Lucknow. He is a senior executive of NABARD (National Bank for Agriculture and Rural Development) with over 30 years' experience. Before joining BIRD, he headed NABARD's Regional offices in Haryana (Chandigarh) and Bihar (Patna)



v

Sridhar Bhallamudi is faculty member at Bankers Institute of Rural Development. He obtained degree in B.Sc. (Agri. Engg. & Tech), from OUAT, Bhubaneswar and PGD (Forest Management) from IIFM, Bhopal, He had also completed CAIIB. His area of specialization includes Agri Projects, Agri Value Chain, Agri. Productivity, Financing, Rural Infrastructure, Financing, PO, Climate Change, Forestry and Seed Sector.

Sravanthi Pantangi, is a UGC-JRF research scholar pursuing Ph.D. in Social Anthropology from the University of Hyderabad. She had earlier obtained her master's and M.Phil. Degrees from University of Hyderabad. Her key research interest is in the area of Social institutions and development.



About the Editors

BV Sharma is a Professor in the Department of Anthropology, University of Hyderabad. He has been teaching in the Department of Anthropology since 1992. His research interests are Medical Anthropology, Anthropology of Education and Community participation in Development. His significant academic contribution is by way of research projects awarded to him by International organizations such as W.H.O, F.A.O, World Bank, DFIDI and National organizations such as NABARD, U.G.C and State level organizations such as Sarva Siksha Abhiyan. He participated in several national and international seminars held in Paris, London etc.

N. Sudhakar Rao is a senior Professor in the Department of Anthropology, University of Hyderabad. He obtained his Masters Degree in Anthropology from S.V. University, Tirupathi and Ph.D. Degree in Anthropology from Rochester University, USA. He was a Visiting Research Fellow in the Centre for Development Studies, Bergen, Norway. Before joining the University of Hyderabad he had served as Professor and Dean, Social Sciences in Central University, Silchar. Earlier he had served the Commission for S.C and S.T, Government of India and ISRO. His areas of interest include South Asian Social System, Action Anthropology, Communication and Religion.

K. Koteswara Rao is a Dr. S. Radhakrishnan Post-Doctoral Fellow at the Department of Anthropology, University of Hyderabad, Hyderabad, from where he received his M.A., M.Phil., and Ph.D. degrees. Earlier, he worked as Senior Research Fellow for the High Level Committee on the status of tribal communities of India, Ministry of Tribal Affairs, Government of India; Post doctoral researcher in the Indian Institute of Science Education and Research (IISER) Mohali, Punjab; and Guest Faculty at the University of Hyderabad and Pondicherry University. His research interests include: indigenous knowledge and its management; development-induced displacement, resettlement and rehabilitation; and tribal and rural studies.

Acknowledgements

Production of this source book in just about four months was made possible by the contribution of quality time, ideas, designs, and intellectual creativities of many friends, colleagues and well-wishers. We will be failing in our duty if we do not acknowledge the help and advice from them.

We place on record our appreciation and gratefulness to the Department of Tribal Welfare, Government of Andhra Pradesh, especially Sri G Chandrudu, IAS (Director, Tribal Welfare) for this unique initiative and for the continuous support.

We owe our gratefulness to the Centre for Innovations in Public Systems (CIPS) and especially to its Director, Sri C. Achalender Reddy, IFS for considering to award this project to us.

The contribution of Sri Vadrevu Ch. Veerabhadru currently Advisor, CIPS, is immense to this project. He not only provided the motivation but also guided us throughout patiently reviewing every unit included in the source book and advised us on the structure, content, expression and many other aspects which helped for meeting the standards that we have set for ourselves for this source book. We feel that his contribution is more than the contribution of ours to this project. We sincerely acknowledge his support in many ways to this project.

The authors of the units in the sourcebook made their best attempt to provide the material according to our requirements in a short time and obliging to our request to take this work on priority basis. They showed the patience to review more than two or three times. We are deeply indebted to each one of them.

Senior and retired scholars like, Prof. Vijay Prakash, Prof. Buddhadeb Choudhury, Prof. Karma Oran, Prof. K.E. Rajpramukh, Prof. Ram Gambhir and Dr. Francis Kulirani have participated in the workshop conducted for selection of themes for this source book along with Prof. Sunita Rani, Prof. Malli Gandhi, Prof. Ramdas Rupavath, Dr. Nanda Kishore Kannuri, Dr. K. Anil Kumar, Dr. Amit Kumar Kisku, Dr. Annamalai, and Mr. Subba Reddy. Their contribution in the design of this source book is valuable. We are very thankful to them.

Our senior colleagues in the department in the University of Hyderabad, Prof. P. Venkata Rao and Prof. R. Siva Prasad have never refused to render help whenever we approached them for their academic advice. We are very grateful to them for their support.

Dr. K. Koteswara Rao, the Post-Doctoral Fellow in the Department of Anthropology, University of Hyderabad and Associate Editor of this source book not only contributed four important units to this project, but also took care to put the other units in order. We are thankful to him for his academic as well as non-academic assistance to us throughout.

Mr. Mariakumar Mathangi (Adhoc faculty, Department of Anthropology) and Mr. Dalibandhu Pukkalla (Research Scholar, Department of Anthropology) contributed the content design for the units. They deserve our special thanks.

The 'Team CIPS', especially Ms. Zenia Taluja and Dr. Sipoy Sarveswar, provided the logistic support to us in various ways. The members of the team deserve special appreciation for their skill, endurance and institutional commitment. We are thankful to each one of them.

Prof. N.Sudhakar Rao

Prof. BV Sharma



Editors' Note

Administering the tribes in the country has been a part of the commitment made through the Constitution to strive for their socio-economic development. However, that has never been an easy task despite having specific policy driven formulations, separate administrative machinery, budgetary allocations and fixed targets over the period of six decades. Of the plethora of problems and issues of tribal society, the role of human component remains significant, though relentless efforts have been made to bring forth tangible results in this particular area. Services of trained and dedicated personnel to take up the arduous responsibility envisioned when planned tribal development was envisaged through the establishment of Tribal Research Institutes or Tribal Cultural Research and Training Institutes. The provision for the same was made in various states with the support of Ministry of Social Justice and Empowerment and later Ministry of Tribal Affairs, Government of India. These institutions are expected to impart training to the functionaries of the tribal welfare departments particularly sensitizing them about the tribal cultures, besides undertaking evaluation of various schemes and programmes implemented by the State Governments either on their own funds or with the support of Government of India. These are also to undertake research into the tribal culture, guide policy makers in preparation of special tribal development plans, in addition to suggesting policies required for the speedy socio-economic development of tribes. But unfortunately, the contributions of Tribal Research Institutions and their role in enriching the human power for gearing up tribal development remains deficient till date.

Apart from these institutions, several academic departments in the universities and various social research institutes have also been engaged in studying the tribal issues and their development for meeting academic needs and interests. Among all these, social or cultural anthropology stands out to be a unique discipline that has been concerned with the tribal issues specifically besides other questions relating to either pre-modern or modern or post-modern societies across the globe. The history of anthropological research in India dates back to the colonial period, 1916, initiated by the British administrators and the foundation of anthropological research was laid in 1945 which later became as Anthropological Survey of India that has been completely devoted to the research into tribal culture and the issues of tribal people. India is one of the earliest countries in the world that initiated anthropological research. In the academic arena, the first post-graduate department of anthropology was established in 1920 at the University of Calcutta, and after the independence, several departments are established where anthropological research has been vigorously followed using sophisticated tools and techniques. Apart from these institutional frameworks, the knowledge of tribal issues has also emerged from the government departments such as former Planning Commission, Commissioner for Scheduled Castes and Scheduled Tribes, and National Commission for Scheduled Castes and the same for Scheduled Tribes from their independent studies. Thus, enormous body of knowledge accrued so far, points out to the need of committed human power in the tribal welfare department.

Though academic departments, Anthropological Survey of India, social research institutions and other Government of India departments and institutions have been

carrying out research in tribal culture, evaluating the tribal development programmes and so on, yet the Tribal Research Institutes are the direct organs of the state governments that have been implementing the tribal development programmes. However, whatever be the reasons, the Tribal Research Institutions in the country have not been able to meet the expectations, and in some cases, they have become non-functional or playing a nominal role. Yet, there is an absolute necessity of such devoted institutions and rejuvenation of them is the need of the hour. Whether this happens or not, the tribal development will continue to act as a separate domain given the pace of development of the tribes in the country. The governments continue to engage and deploy their human power and machinery for the cause of tribal development. The officials are agents of the government who are engaged in the development programmes of the tribe and in most of the cases have the knowledge or gained such knowledge of the tribal people on the basis of their personal experiences though they are experts in their own field of specialization. The government is mostly seen, felt and experienced by the tribal people through these officials or machinery of the government. Their expertise in their special fields requires to be synergized with the knowledge about people whom they are serving for obtaining the desired results. Such synergy of knowledge may have eluded a necessary component in their formal training in the expert field, but its significance comes very real in practice. More importantly, the knowledge and sensitivity appear as a big help, when it comes to tribal society which might be different from their own society in which they have grown. Therefore, these officials or functionaries require an orientation towards tribal issues and such orientation could be provided by the Tribal Research Institutions, but such exercises are hardly ever practiced. Nor is there any programme or module or handbook developed so far in the country.

Over the years there has been a number of high power Committees that have studied tribal issues, submitted reports and made suggestions on the basis of which several Acts are passed and further modifications of the Acts have also taken place. Consequently, tribal policies have also been modified, new regulations have emerged. Simultaneously, the range of tribal issues also got changed/expanded in course of time, new issues surfaced while the old ones persisted or old issues continued with new dimensions. But there is no single source to provide all these changes either in terms of administration or the tribal situations due to scattered information and dispersed sources. Even if the officials working in tribal areas desire to acquire a comprehensive knowledge of tribal issues, and efforts made by the government about the tribal development over the years, it becomes a herculean task to pool together the scattered information to a single place.

From the above discussion, it is needless to emphasise the need for strengthening the human component in the efforts of the tribal development in the country. Though the government realised its importance, there was no concerted effort towards these ends. As there is neither orientation of officials, nor guidelines for such exercise or comprehensive information about the tribal development, the present exercise is mainly aimed to fill this gap.

The sourcebook presented now in this regard is intended for the use of officials working in the government departments concerned with tribal welfare in the light of the above discussion as a guide. It may be used for self-learning or as a manual in the context

of training in a formal teaching and learning mode. This document is conceived with three assumptions: (1) many functionaries have little knowledge about the emergence and existence of various Acts, amendments to Acts, schemes currently in vogue (including the spirit and context of a specific scheme; fund position, procedures of sanctions and execution) that are relevant for their functioning; (2) the functionaries working in tribal areas are short of cultural competency to effectively function and so there is a need to help them to identify where this shortfall could have an impact and how it would affect their successful functioning; (3) working with communities and achievement of community participation is possible only when the functionaries understand the structures and institutions in the tribal communities and succeed in identifying the cultural resources that enhance the participation. Keeping these assumptions in mind, the sourcebook has been planned drawing strength from the anthropological research inputs in terms of tribal culture, evaluation of various development programmes and findings. Further, it has taken into consideration the potential of tribal traditions, knowledge and ethos that can be used for their own development in the contemporary political and economic backdrop. The sourcebook is expected to provide not only required knowledge on tribal society and its issues, development efforts but also motivation that the reader would need for committed service.

The source book is designed in nine volumes. Volume 1 contains units that focused on themes which are assumed to be of general interest and which provide the prerequisite information that enables comprehension of information provided in the other units. Volumes 2-9 are meant for functionaries of different departments and working in the tribal areas. The themes or units covered in the general section include 'Indian society: Indigenous populations, Scheduled Tribes and Scheduled Castes' that provides the background of tribal society in Indian context, and the theme 'Building Emphatic interactions with Tribals' is very important as it discusses the relevance of humanistic approach to the tribal issues for the ethnocentrism has been a great impediment for the proper attitude towards the tribe around the globe. 'Approaches to Tribal Policy and Tribal Development' is the general theme that highlights the basic philosophical framework of the government of India in which tribal development is conceptualized. The theme of 'Role of Traditional Leadership and Tribal Institutions in Development Process' has been included in this section to show forth the significance of leadership in the tribal society and because harnessing this resource is utmost important for ensuring community participation. The theme 'Constitutional framework, Human Rights and Child Rights' elucidate the concerns of the state about the vulnerable nature and precarious conditions of the tribes who live in close interaction with the surrounding, dominant non-tribal society. The theme 'Contemporary Tribal Challenges' discusses not only the age-old problems but also the new problems emerging through new interventions and problems emanating from the modern society. The section also includes the themes 'Tribes in Andhra Pradesh: Diversity and Social Organization' which gives the brief account of the tribes of Andhra Pradesh and 'Social organization among the tribes of Andhra Pradesh'. The inclusion of this theme has been considered important keeping in view the need to have a general understanding of demography, culture and society of tribes in the State. Thus, this section provides general reading necessary for all functionaries regardless of their expertise or professional background.

The volumes 2-9 are meant for role-specific professionals working for different departments such as (1) Revenue; (2) Police; (3) Forest; (4) Health; (5) Education; (6) Development (including Agriculture); (7) Panchayat Raj; (8) Marketing and (9) Youth Welfare; Entrepreneurship development, Tourism and Culture. The themes covered in these different sections are to facilitate the functionaries for enhancing their knowledge and skills on issues that are important for their specific roles in their respective departments. What guided while designing these sections, are the following concerns:

The Revenue deals with a range of aspects covering not only land issues but also the issues of tribal identity certificate, and in this case there have been problems. For example, land alienation is an issue in Scheduled V area but at the same time, there is a problem of land acquisition by the state itself against the interest of the tribes. There have been several interventions through the enactment of Acts and the officials should be familiar with these. In Police department, the issues are related to not only atrocities committed against the tribes but also Naxalism and tribes being sympathetic with those who raise arms up against the state. The customary law of the tribes takes care of the majority of law and order situation, but at times police intervention becomes necessary as the former cannot remain outside the statutory law, court and legal matters. Forest is the soul of the tribes, and therefore, the life of the tribe has been strongly intertwined with the forest department. Involving the tribes with the activities of the Forest department deserves the highest priority, but synergy in this regard is yet to be achieved despite the state's recognition of this vital issue decades ago. The departments concerned with Health, Women and Child Welfare and Public Health engineering are crucial as the environmental degradation, population growth, contact with non-tribes etc., have a significant impact on the tribal health. The tribal indigenous systems continue to be a great source of maintaining health, yet there are limitations of structural kind, and as we can reflect more, we are able to see that the tribes have not been averse to the modern health practices also as well. However, there is a need for bringing these systems together for improving the health standards of tribes.

The role of Education department in tribal society is immense; it is obvious, through education only, the tribes can face the modern world with better preparation. Though some progress has been made there is a lot to be achieved, and a number of hurdles are there on this road yet to overcome. The departments concerning the Infrastructure, Housing, Agriculture and allied activities play a crucial role in the overall development of the tribes. The officials shall ensure community participation by being empathetic and sensitive to the needs of people and understand the cultural ethos and recognizing the local resources and time-tested indigenous knowledge. Finally, the departments that deal with the Youth Welfare, Entrepreneurship Development, Tourism and Culture actually shall guide the future generation and equip it to meet the present challenges and prepare for the future with certain innovative ideas. They should be creative and develop the habit of thinking out of the box, and exploit the tribal potential for their own good. Thus, in brief the volumes 2-9 form the core of this exercise in reorienting, re-equipping, rejuvenating the functionaries or officials and providing material on tribal development in a holistic perspective.



Finally, we shall say that it is a unique experience of bringing together several renowned and experienced resource persons to share our ideas with them and receive their reflections and also convince some of them to contribute to this volume. We sincerely acknowledge their help and are really grateful to each of them. Since it is the first of its kind on the tribal development in the country, we are sure this sourcebook is not free from some omissions and commissions. We will surely rectify these in the subsequent edition once we get feedback on the present volumes.

Prof. N. Sudhakar Rao

Prof. BV Sharma



1

Community and Natural Resources for Tribals and Their Management

A Commission's suggestions to fix India's environmental management said "...the first is to exempt some big project proposals from the citizen involvement and public hearing process required by India's environmental impact assessment rules. The second is to replace the politically appointed and frequently corrupt national and state pollution control boards, which review and issue permits, with professionally staffed national and state environmental management agencies" (2002).

Source:

New security beat 2002. What Can Be Done to Strengthen India's Natural Resource Management? [Part 2 of 2]. Wilson Center - ecsp. <https://www.newsecuritybeat.org/2015/03/strengthen-indias-natural-resource-management-part-2-2/>: accessed on 7.4.2018.

- *Do you agree with the above suggestions of the Commission?*
- *Whether these suggestions will be acceptable for the tribes?*

Contents

1. Introduction
2. Learning Objectives
3. Natural Resources
4. What is Indigenous Knowledge?
5. Significance of Understanding People's Worldview and Perception of the Environment
6. Are There Cultural Specialists of Forests and Animals in Tribal Societies?
7. Understanding the Relationship between Forest (Natural Resource) and People
8. Significance of Forests to Tribals
9. Ownership of Natural Resources by the Tribal Communities
10. Promoting Community Based Natural Resources Management
11. What Makes CPRs Successful?
12. The Idea of Stewardship for the Sustainability of Both the Environment and People
13. Summary
14. Recapitulation
15. Key Terms
16. Activity
17. References

1. Introduction

Tribals live in midst of forests, on hills and in deserts and in the coastal areas and over inland water bodies. They sensitively depend on the nature. For the management of resources that they have for living, they have evolved certain value systems, practices and institutions. In this unit, it is attempted to give clarity on some of the aspects relating to community and natural resources, their nature, control, use, and management.

2. Learning Objectives

After going through this unit, the reader is expected to learn:

- 1) The concept of natural resource, common property resources/regimes and indigenous knowledge;
- 2) The idea of sustainability;
- 3) The perception of tribal people towards their environment and nature; and
- 4) The Idea of Stewardship and its implication on the relationship between nature and people for the sustainability of both the environment and people.

3. Natural Resources

The unfinished or finished product or service derived from nature is known by the term “Natural Resources”. The following examples illustrate this:

- leaves that are used to make plates,
- wooden poles to erect a dwelling hut,
- water in the rivers, streams, ponds etc.,
- pastures that sustain sheep and cattle,
- tubers, nuts or meat of animals eaten as food,
- the air we breathe.

Though these resources are natural, the communities act or relate to the natural world using their cultural models or understanding that they have about them. These cultural models get reflected in their perception of the environment or worldview. The perception that people are an intrinsic part of nature enters the worldview of tribals across all the continents. For example, tribals see themselves as an intrinsic part of the forest, no less than the animals and plants.

The Mbuti, of the Ituri forests of Zaire, Africa say “the forest is a father or mother it gives us everything we need - food, clothing, shelter warmth...and affection. Normally everything goes well, because the forest is good to its children” (Turnbull, 1961).

“Warlis were amongst the first ‘green’ with nature personified and worshipped as ‘Hirva’ (green). Hirva was the source of all wealth. Warlis identify themselves with Pardhi; the hunter companion of Hirva. Nature’s produces were gifts of Hirva, rather than their fruits of labour or their possessions” (Pieriera 1992:189).

4. What is Indigenous Knowledge?

Culture serves the role of a compass, whereby communities navigate their relationship with nature and natural resources. Nature and peoples relationship is codified in the community's cultural knowledge. Their knowledge system is generally passed on from one generation to another verbally and members learn by practice method, within the context of nature. The knowledge system that tribal and forest-dwelling communities possess is known as Indigenous Knowledge (IK) or Traditional Ecological Knowledge (TEK). TEK encapsulates the perception and worldview of communities and their environment and culture that is local. The body of knowledge gathered from the perspective of people, their categorization of nature, their theories of origin of species and other aspects relating to the natural world is identified by anthropologists and scholars as ethno-science.

Examples of Traditional Knowledge of Some Tribal Communities in Andhra Pradesh

- The Chenchu can tell how far is a honeycomb from a particular place based on their observation of how the bee is flying.
- The Savaras rejuvenate forest by leaving the stumps of the trees while doing slash and burn cultivation.

5. Significance of Understanding People's Worldview and Perception of the Environment

Communities use their TEK to protect and conserve nature which in turn sustains communities. For such communities, natural resources are an important component of their lives without which understanding these communities becomes impossible. The cultural logic of tribal communities is that they do not destroy resources on which their survival is hinged upon. Why would someone destroy anything that gives them life or they depend upon for their living, it goes against the logic of survival. This cultural value towards resources may be comprehended through people's perception of the environment. Hence, understanding people's worldview and perception of the environment is necessary for managers and planners in engaging with forest dependent communities.

6. Are there Cultural Specialists of Forests and Animals in Tribal Societies?

Tribal communities have cultural specialists who possess specialized knowledge of a particular domain say for example medicine or the plants needed for curing diseases. These specialists are barefoot or grassroots scientists as they are repository of knowledge of the forest and environment. Using certain indicators of the forest, like hoove prints of animals, or observing certain plants or animal calls, blossoming of flowers; Tribal members can narrate immensely about the forest and the behavior of animals.

The Toda pastoral people of the Nilgiri hills can predict the end of the monsoons by observing certain species of flowers blooming. They can also locate a bee hive

by observing the dropping of pollen on leaves of plants. Such is the in-depth knowledge and sensitive observation skills of people living within the context of nature.

The Chenchu of Nallamalai forests have enormous knowledge on honey bees and their behavior. Similarly they also have great knowledge about different wild animals. For example, based on foot prints, they can identify which animals moved, how many in the group, and in which direction.

7. Understanding the Relationship between Forest (Natural Resource) and People

The relationship between people that are dependent on natural resources for their livelihood and living is not simple. We need to understand that the forest is not merely a material object for the fulfilment of material requirements of the community. It is much more than that. The relationship between natural resources and people has deeper philosophical and cultural significance in the lives of people. These natural resources are life giving and life bearing entities. Hence, it is essential to comprehend this relationship with the idea of engaging with the community members during the process of administration. This will contribute to the sustainability of natural resources and the well-being of communities that are dependent on these resources. Though the nature of relationship may have changed over a period of time, understanding the world view of natural resource dependent communities is essential for our appreciation of their logic and hence engagement with the communities. Their perception of the forest and environment informs people's behavior and conservation of biodiversity.

8. What is the Significance of Forests to Tribals and How Do They Protect Them?

Tribal people in India depend on forests for wood as fuel, plants as herbs for curing diseases, fodder for their domesticated animals, honey and other non-timber forest produce such as gum, lac and raw material of broom grass and bamboo for making products. Forests are protected as 'sacred groves' in which a variety of tree species and plants are present. These sacred groves are considered as the abode of spiritual beings and gods that communities revere.

In the state of Meghalaya the sacred grove known as Mawphlang covers 75 hectares. Research has recorded 79 sacred groves with various sizes from .01 hectares to 1200 hectares (Padmanabhan 2011:49).

8.1. Changed economic and political dimensions and change in the peoples construct and use of natural resources?

Natural resource is a socially constructed and culturally defined concept having economic and political dimensions as well. For example, during the 1700s the European settlers in Atlantic Canada used lobsters as fertilizer in their fields. By the year 2000 lobsters became a very valuable species in the small- scale fishery industry (Wiber *et al.* 2009 cited in Berkes 2010). This example highlights how the cultural and economic meaning of lobsters has

changed over a period of time. Understanding the various dimensions gives us a better understanding the resources, their management and people relationship with the environment. Similar is the case of 'Gum Karaya', a minor forest produce covered by tribes of AP, especially the Chenchus. Prior to 1956, the year in which Girijan Corporation was established, the plant has no economic significance for the STs. But once all started procuring the gum at a remunerative price, this item of MFP has almost become the backbone of the economy of the forest dwelling Chenchu families.

9. Ownership of Natural Resources by the Tribal Communities

The nature of ownership of property by tribal communities is by and large communal. This does not mean that individual private property does not exist. When it comes to using forests and natural resources, the nature of property is organized along communal lines but user rights lay with individual members or a household. In other words the resources are owned communally or jointly. The natural resources are the collective responsibility of the community. If an individual damages or breaks certain rules pertaining to the maintenance of the resources, the communities' council decides the nature of punishment. Violation of rules invites communal sanction. Hence, for communitarian based societies social sanctions are strong. Such institutions that protect resources by recognizing the collective ownership but promotes the individual's right to use these collectively owned resource is recognized as Common Property Regimes (CPRs).

9.1. What is the Scope of CPRs?

Common Property Regimes may be described as the institutional provisions for the shared, joint and collective use and ownership of natural resources. CPRs are formed over diverse landscapes that include mountains/hills, arid and semi-arid forests. CPR can be used by individuals but cannot be owned by any one of them. The natural resource becomes the property of the community. The users of the resource are many, wherein each individual member has an independent access to these resources. The members collectively manage these resources thereby making it a common resource. The group takes decisions on the number of users and who is permitted to use these resources and the ones restricted from using these resources.

9.2. Are There Different Property Ownership Arrangements Under CPR?

CPR includes a wide variety of property ownership arrangements. They include a communal system of the use of resources in the case of hunting and gathering communities, the mixed system of community owned pastures in the case of pastoralists having their own agricultural fields and the large tracts of collective farms in socialist economies and broad range of shared rights to regulate environmental consequences of individual behaviour of industrial economies.

9.3. Public Good and Common Property Resource

A public good is different from a common property. For example, a street light is a public good, it may have multiple users but the ownership and maintenance may be with a public

authority institution, whereas a footpath in a forest used for collection of MFP is treated as a CPR.

10. Promoting Community Based Natural Resources Management

Community-based Natural Resources Management (CBNM) is a relatively new idea in development agenda. It goes by the name Community Based Management (CBM). These projects and policies are designed to improve the livelihoods of rural poor who are directly dependent on natural resources.

CBNM aims to promote democratic decision making and equally distribute the benefits from natural resource at the grass root level. CBNM has a bottom up approach promoting local peoples participation in planning, development, research, management and policy making for the community as a whole. The objective of CBNM is to make development more decentralized and democratic.

10.1 Is Privatization or Nationalization of CPRs a Good Idea?

Suggestions are made for making CPRs private or to nationalize them. The privatization idea suggests eliminating the ownership rights from the hands of community. Elimination of community ownership of natural resources is given as it is argued that individual or public ownership would enhance efficiency in resource use and ensure the long term protection of resources. However, contrary to such opinions, case studies from all over the world demonstrate that the arrangements in place of common property regimes are inefficient in promoting the sustainable resource management.

The loss of rights does not ensure the prevention of physical access to resources; people continue to access and use the resources when they stay nearby. Once people lose their rights and opportunities to use these resources, they lose interest and the incentive they once had in managing and protecting the natural resource base. The loss of property rights results in a lack of ownership in natural resource management. Often, this leads to competition amongst users for accessing these resources. Hence, those who protected resources may become poachers of these resources.

11. What Makes CPRs Successful?

CPRs do work efficiently and it would be incorrect to declare CPRs as regimes that existed once upon a time in history and are no longer relevant to contemporary society. These ideas are misguided. An important factor for a successful CPR is that the users should have little or no interference in conducting the affairs of the CPRs. In many cases when the products from CPR gain a market value there is a claim by members outside the group of CPRs to make a legal claim to these resources. The fact remains that these communities have been responsibly managing resources without any legal protection for a long time. If these traditional users have legal rights over their produce this will give them better opportunities commercially.

In Andhra Pradesh as elsewhere in India, the users on open-fields manage planting, harvesting, grazing and irrigation successfully due to the ignorance of the state and national governments.

In Papua New Guinea, the traditional forest rights are legally valid. The portable sawmills used by village people are economically more viable and efficient that brings more wealth into the village than the multinational corporations.

The idea that CPRs worked efficiently earlier and to declare that CPRs as regimes existed once upon a time in history and are no longer relevant to contemporary society, is misguided. Let us look at two case studies as to how indigenous and other communities manage their natural resource base. One case study is from India (Padu System) and another from North America (Salmon Rush). Please pay attention to the relationship between people and their environment and how they treat these resources. Upon careful understanding one would appreciate the stewardship dimension in relationship to the environment and natural resources.

Conservation and use of CPR: Padu System among the fishing communities in South India

The Padu system is an example and form of conservation and use of Common Property Resources. It is a traditional institution found among the fishing communities in South India and Sri Lanka for many generations now. Padu means fishing place. Padu system includes the fishing places and fishing equipment's used in the Pulicat lake.

The Padu system is practised by village communities surrounding the Pulicat lake in Tamil Nadu and Andhra Pradesh. Padu in Tamilnadu works among the Pattinaver caste, a traditional fishing community. The caste enters into verbal agreement deciding the traditional fishing rights of the community members. The lake provides livelihoods to 30,000 full time fisher people spread in 52 villages. The membership to the Padu requires a person to be a member of Talekettu institution. The membership to Talekettu is based on rules that include only married males of 21 years, belonging to the village. The members who belong to the Talekettu institution have the right to fish in the Padu spaces.

Padu Rules¹

The allocation of Padu rights is done amongst the members within the village panchayat. The allocation of fishing places (Padu) is decided in annual meeting wherein lots are drawn by the village panchayat for each unit (a single boat with three men). The Padu system prevents access to its members to the most productive prawn fishing grounds and prevents the members from using advanced fishing gears, particularly Padu Stake nets. However, eligible members who are expert fishermen can use the nets. The ones without rights have to employ less efficient non-Padu fishing equipment that includes cast nets, Gill nets and fishing by hand.

The fishing units are allocated spaces in the fishing grounds on a rotational basis. Fishermen outside the Padu system are not permitted to access the Padu grounds. This ensures that all fishing units get to fish at least once in all the Padu grounds in the year. This institutional arrangement permits each fishing unit to fish in resource rich

¹ http://www.sristi.org/cpr/cpr_detail.php?page=113&Mode=Institutions accessed on December 28, 2017 at 9:00 am.

and poor areas. Thereby, it equally distributes the fishing grounds and opportunities to its members. Conflicts that arise between users and village members are dealt in the village panchayat. However, there are instances where the conflicts are resolved temporarily by peace committees of the State or police.

The system is not without its share of change and difficulties. The Padu system is becoming unstable as the number of non-members is rising. Despite this the system is making adjustments to accommodate changes, the fishermen of the system are decreasing the amount of fishing per fisherman instead of increasing the Padu area. This may raise questions of sustainability as more and more non-traditional users are attempting to access the Padu areas. This is causing conflicts between the Padu members and non-members. The Padu system is opening its membership to non Pattinaver caste members. This brings changes within the caste composition of the Padu system. Another change that the system is experiencing is the fishing for Prawns that fetch a good price in the market. Besides motivated by market forces, political pressure is influencing the Padu system. The non-traditional fisherman are encouraged to form cooperatives to fish for Prawns at Pulicat lake. “These *padu* systems are important for managing resources as well as people; they help reduce conflict and provide social identity for members of the fishing caste. *Padu* rules are flexible, for example, based on local observations of environmental change, allowing adjustments to deal with siltation and periodically redefining fishing sites to be allocated (Lobe and Berkes 2004). At the same time, note that *padu* itself is based on an institution (the Indian caste system) which has persisted despite laws against it – thus showing that resilience is not always positive” (Berkes 2010:29). The Padu system is an example of a resilient system, a system that is adjusting and changing. This example emphasizes the idea that local systems can be flexible and are capable of being locally controlled. It also means that CPRs are understood as institutions from the past that are not relevant to contemporary times as they are unable to adapt to changes. The above example demonstrates that such notions are misguided and CPR adjust to changes and can withstand turbulences caused by external interventions.

Management of CPR among the Chenchu, Andhra Pradesh

The Chenchu people regard the forest as important aspect of their life. Traditionally, they are hunter and gatherers. The community members are divided into different clans that are named after plants, animals and birds. The flora and fauna are said to be ancestors of the Chenchus. Hence killing these associated ancestral plants and animals is a sin by the respective clan. This value system helps conserve natural resources. Besides being hunters and foragers they collect Non-Timber Forest Produce (NTFP) and sell to the GCC. They hunt small animals and “They used to collect tubers like *nallagadda*, *eravalagadda*, *noolagadda*, *chenchugadda* and leafy vegetables like, *devadaaru*, *boddaku*, *chenchalaku*, *nallakura* etc. In addition, they used to collect wild fruits like *konda ethapandlu*, *velagapandlu*, *regipandlu*, *bikkipandlu*, *sitaphalam*, *balusupandlu* etc.” (Rao and Ramana 2007). They use TEK to protect and conserve animals. They do not hunt animals that are pregnant. While extracting plants and tubers they retain a part of the tuber for its regeneration. Such practices ensure the sustainability of biodiversity. Chenchus save the forest by demarcating areas for

collecting of forest produce clan-wise and village wise. Public lands are allocated based on the needs of each house and the ability to collect forest produce. They take special care to ensure ripe fruit seeds fall for germination. Tender bamboos and tender beedi leaves are not harvested. Such practices ensure the growth and survival of plant species.

Salmon Rush: CPR Management by Indigenous Groups in North America

Many indigenous groups in the Pacific Northwest of North America, from northern California to Alaska practice a ceremony called First Salmon. Salmon is a fish that travels upstream from the ocean to spawn in the upper reaches of the rivers. When the fishes come into the river, the tribes are not permitted to fish until elders of the community gave permission (Swezey and Heizer 1977 cited in Berkes 2010). There are variations within the indigenous communities on deciding when the catching of fish would begin. The act of not allowing indigenous members to fish serves the purpose of sustainable usage of these natural resources. The knowledge of these fishing communities is such that a trained member of the group can determine the numbers of the shoal of fish by merely observing the fish in the river. "This is similar to what contemporary biologists do, with population models and counting fences in salmon rivers, to establish daily harvest quotas and to allow sufficient escapement, a term that refers to making sure that a portion of the reproducing stock is able to get by the fishery and reach spawning grounds" (Berkes 2010:29).

The elders of the community wait for a considerable number of Salmon to reach the upper reaches of the river to spawn. This ensures the reproduction and continuity of Salmon species. The elders allow some of the Salmon to escape before the fishing season is open for the community members. The deceleration of fishing would vary upon the size and frequency of the Salmon in the river. "The leader did not use a resource management discourse; he supervised a ritual consistent with cultural values encoded in stories about respecting salmon, allowing them to reproduce, and not interfering with the migration leaders" (Swezey and Heizer 1977; Williams and Hunn 1982 cited in Berkes 2010:29). The application of ecological knowledge for the sustainability and a livelihood safety for indigenous communities demonstrates not only their knowledge of the surrounding but also the stewardship these communities hold. Their institutionalization of the First Salmon ceremony through cultural rules and ceremonies conserves natural resources and promotes sustainability of resources. This example also shows that natural systems are not always predictable, socio-ecological systems are complex and they interact with each other and adjust to changes.

11.1. How Did the Perspective of Natural Resources Change? What are Consequences of Separation between Users and Managers of Resources?

In the case of non-users of natural resources, nature is viewed as a source of raw material for the process of material production. If this resource has to be produced nature should be productive as well as predictable. This perception of nature requires natural resource professionals as arbiters of human-environment relations (Berkes 2010). Resource

management then seen for the government or professional points of view is that of certainty and predictability of natural resources. The natural systems complexity and diversity is reduced to a simplified state. Take for example monoculture farming that simplifies the complexity that exists in the natural system. Diversity and variation is eliminated with the aim of achieving factory like harvesting and marketing of products (Berkes 2010).

Since the colonial rule in India, government scientists and managers of the new system took CPRs under their control. Their objective was to calculate the surplus that may be harvested from nature. This management approach was arrived at by rejecting local and traditional knowledge that managed the CPRs for a long time. Colonial and post-colonial managers rejected CPRs as it did not fit in to the larger scheme of commercial production and markets. The CPRs did not appear transparent to the state and perhaps the new managers of the resources aimed to take complete control of resources. The legitimacy of expertise to the knowledge and management of CPRs was restricted and not shared with the traditional users of natural resources (Berkes 2010). As Berkes observes, “The notion of the separation of user from manager, and the idea that a remote agency knows best what to do with a local group’s resources just does not make sense to most local and indigenous knowledge holders” (Berkes 2008 in Berkes 2010:24).

The separation between users and managers of resources was conceptualized during the colonial period and sustained in independent India. The separation has created a deep wedge between people and authorities having stakes in natural resources. Hence, the rejection of government’s management by indigenous people and resource dependent communities is not merely politics but has a lot to do with their perception and worldview too (Berkes 2010).

Given the changing context of natural resources and its implication on communities, it becomes essential to keep people central in our understanding of nature. Becoming sensitive to peoples way of life and cultural practices promotes a better relationship between people and administration. Hence, allowing one to learn from people and being alert to diverse ways of living which will facilitate an environment and understanding wherein policies can be people centered.

12. The Idea of Stewardship for the Sustainability of Both The Environment and People

The term ‘management’ as Berkes points out, is loaded with the idea of domination of nature, efficiency and an over simplification of social and ecological relationships. Management entails the idea that experts know everything best about nature. Nature is understood scientifically and ‘managed’ in a command-and-control approach. It is a fact that in spite of our expert knowledge of the forest, environment and nature we are unable to predict precisely how nature behaves or reacts. The term management may be replaced with stewardship in place of domination and control of nature. Stewardship suggests using natural resources responsibly, that takes into consideration the interests of society, other species, future generation, private needs and accountability to society. People living in nature and users of natural resources are stewards of natural resources. We can only carefully use, protect and preserve nature and pass it on to our future generations if we are looking for sustainability of natural resources. Hence, stewardship may be a better term

and concept in describing the relationship of communities with nature where they do not control or dominate nature.

13. Summary

Tribal/indigenous communities are dependent on natural resources. Their lives and culture are linked to nature. Culture becomes an important medium through which tribal people relate with nature. Hence, the sustainability of nature is essential for the survival of tribal culture and vice versa. Tribal communities are stewards and not mere users of resources. The distinction between users and managers of natural resources has its own problems. Tribal communities who have been using natural resources for generations are not considered 'experts' of nature and are largely viewed as users or resources dependent communities. Tribal communities have a deep knowledge about the environment they live making them experts as well. Further, there is a value of conservation and sustainable use of natural resources and biodiversity in-built within Traditional Ecological Knowledge (TEK) systems. TEK is accumulated knowledge that is passed down through generations. The cultural knowledge of nature is encoded in the minds of people as indigenous knowledge or TEK. It is people's knowledge. Using this knowledge tribal communities relate to nature and use its resources. It is important to understand TEK or IK if one wants to understand how tribal communities relate to nature. Understanding TEK helps in developing a sensitivity towards people and their lived world. Tribal communities' own resources communally (CPR). Understanding the relationship between communities and the way they relate to their natural resources is essential for sustainability of people and resources.

14. Recapitulation

- How do we understand the link between tribal communities and nature and natural resources?
- How is the concept of stewardship important in describing the relationship between tribal communities and nature?
- How does the concept of TEK or IK help communities to relate to nature?
- What do you understand by CPR and CBNM? What are the ways in which people manage their resources?
- What are consequences of separation between users and managers of resources?

15. Key Terms

Natural resources, Common property regimes, management, culture, perceptions

16. Activity

- Establish the significance and use of the plants and animals from the perspective of the community you are working with.
- Find out the institutional arrangement of using the common property resources in any particularly vulnerable tribal group (PvTG) based on your field experience.

12 • Natural Resource Management and Biodiversity

- Find out how the perceptions of members of an indigenous community changed towards certain natural resources over a period of time?

17. References

- Altman, I and M Chemers.1980.*Culture and Environment*. California: Brooks Cole Publishing Company.
- Turnbull, C M. 1961.*The Forest People. A Study of the Pygmies of the Congo*. New York: Simon and Schuster.
- Periera, W.1992. Attitudes to the Environment. In Geeti Sen, (ed.) *Indigenous Vision: People of India*. New Delhi: Sage Publication.
- Padmanabhan. 2011. *Forests and Tribals*. <http://www.kalpavriksh.org/images/CLN/forests%20and%20tribals.pdf>
- McKean, Margaret. A. 1996. Common Property What Is It. What is It Good For, and What Makes it Work? <http://dlc.dlib.indiana.edu/dlc/bitstream/handle/10535/5330/Common%20property%20what%20is%20it%20what%20is%20it%20good%20for%20what%20makes%20it%20work.pdf?sequence=1>
- Berkes Fikret. 2010. Shifting Perspectives on Resource Management: Resilience and the Reconceptualization of 'Natural Resources' and 'Management'. *Maritime Studies* (9):13- 40
- Arnold, J.E.M & W.C Stewart. 1991. Common Property Resource Management in India. *Tropical Forestry Papers 24*. Oxfordshire: Oxford Forestry Institute.
- Rao, V.L.N and G.V.Ramana. 2007. Indigenous Knowledge, Conservation and Management of Natural Resources among Primitive Tribal Groups of Andhra Pradesh. Anthropology Today: Trends, Scope and Applications. *Anthropologist*, Special Volume No. 3: 129-134.
- Padu Rules- http://www.sristi.org/cpr/cpr_detail.php?page=113&Mode=Institutions accessed on December 28, 2017 at 9:00 am.

2

Role of Socio-Cultural Elements of Tribal Life in Forest Conservation

"... there has been a long-standing acrimonious relationship between the beliefs and practices of traditional communities and those of formal forest science. Therefore, attempts at solving the challenges of forest management in recent times have ignored cultural practices of indigenous people." (2017:2)

Source:

Asante, Eric Appau, Stephen Ababio, and Kwadwo Boakye Boadu 2017. The Use of Indigenous Cultural Practices by the Ashantis for the Conservation of Forests in Ghana. DOI: 10.1177/2158244016687611. journals.sagepub.com/home/sgo.

- *Is the above observation true in Indian context?*
- *Are you familiar with any of the traditional practices of forest conservation?*

Contents

1. Introduction
2. Learning Objectives
3. Conservation Practices
 - 3.1. Common Ground
 - 3.2. Cultural Foundation
 - 3.3. Totemic Practices
 - 3.4. Sacred Groves
 - 3.5. Medicinal Uses
 - 3.6. Sacred Animals and Their Spaces
 - 3.7. Identity
4. Economy
 - 4.1. Livelihood Needs
 - 4.2. Challenges
5. Summary
6. Recapitulation
7. Key Terms
8. Activity
9. References

1. Introduction

The man-nature relationship is frequently discussed by scholars, administrators and activists in different forums. Nature worship is known to be the oldest form of religion of human society. Humans depend on the nature not only for utilitarian reason but also for it being sacred. The practical needs and such belief naturally drives people to design strategies of conservation. These strategies are so designed that they have become part of everyday practices and are often inscribed in myths and folktales and objectified in symbols. In fact, these have been experimented, accepted and implemented in various ways and walks of life by the forest-dwelling communities. Therefore, they are often known as natural conservators. They design strategies of conservation depending on the needs that they identify. These strategies are time-tested and proved worthy to adopt, and the same time they are dynamic and change periodically according to changing conditions. The essence of such practices is relevant even today.

There is a possibility for a gap to exist between people and functionaries in understanding each other's perception on nature, its diversity, resources and conservation. Several efforts are being made by the functionaries specially the foresters to conserve the forest ecosystem. Similarly, the forest dwellers also have a legacy of conserving nature from time immemorial. However, it was proved a daunting task for both the stakeholders to engage with each other in a meaningful relationship while achieving the same objective. Undoubtedly, it is not impossible. A simple way out is to understand each other's ideas and create platforms to facilitate dialogue and partnerships. A reorientation and sensitivity to people's needs is very important. In this connection, a shift from rigid governmental thinking to accommodate local conditions and aspirations of people is much needed. This unit discusses the ideas, perceptions, and strategies on conservation of forest by forest based communities with examples from different contexts. In turn, the unit assists the functionaries in understanding people's perspective and help to design strategies for better engagement with the communities in conserving the forests and other natural resources.

2. Learning Objectives

At the end of this unit, you will be able to:

- 1) Understand the social, cultural, economic and political significance of conservation for forest dwelling communities;
- 2) Examine the relevance of the traditional practices of conservation in contemporary era;
- 3) Help integrating techno-scientific practices of conservation with traditional practices;
- 4) Analyze the challenges in conservation of forest; and
- 5) Suggest measures for the conservation of the forest.

3. Conservation Practices

3.1. Common Ground

At the World Parks Congress held in Durban in 2003, approximately 5000 conservationists assembled. They announced the adoption of a 'new paradigm' for protected areas which would respect the rights of indigenous peoples and local communities (Colchester, et al. 2008). It urged commitment to involve indigenous peoples in establishing and managing protected areas and participate in decision making on a fair and equitable basis in full

respect of their human and social rights. Durban Accord's (World Parks Congress 2003) action plan states that the development of any conservation system must take full account of the rights, interests and aspirations of indigenous peoples, as well as of their desire to have their lands, territories and resources secured and protected for their own social and cultural survival. The Accord believes that the indigenous peoples are the natural conservators. It makes clear that the indigenous and local communities must fully participate in the establishment and the management of the protected areas. It also mentions that there must be mechanisms to guarantee their due share from these areas. As a result, the modern conservation institutions all across the world started recognizing the efforts of indigenous communities in the protection of nature.

Conservation of nature is the need for society for variety of reasons. It has become an integral part of human life either as belief or as livelihood. Indigenous peoples and other traditional forest dwelling communities have clearly demarcated sites for various purposes including deities, animals, human habitat and survival. There are no significant evidences for the exploitation of these resources by such forest dwelling communities. They never aimed at surplus production using the forest resources. Their economy is popularly known as 'hand to mouth' or 'limited objectives' economy. This was often based on the principle of harmonious co-existence and mutual wellbeing. Such worldview denoting the unconditional conservation while use and share the resources judiciously. There are ample evidences from all the indigenous communities about the maintenance of the forest based on mutually agreed-upon customary boundaries among the people from a cluster of habitats or within the habitat. Although there are violations, misconceptions and over-emphasis on community conservation; the very idea cannot be ruled out.

The regulations of the state in modern era are seen as determinative force by forest dwelling communities. They confront state if they feel that their movement in the habitat is restricted. They believe, forest is their home. Their religion and economy are interwoven with forest. They do not want anybody to question their ownership of forest. They believe that the state is grabbing their resources. For them, the most significant constituent of the state is the forest department. In such context, regulations without convincing the indigenous communities are not very useful. Rather, collaborating with them and taking measures for affective participation is essential. They should believe that their voice is heard. This must be the primary concern of the officers. The officers must believe that the worldview of indigenous communities do not lead to the destruction of forest. Despite a few exceptions, the worldview of traditional forest dwellers emphasizes on conservation and sustainable use of resources. Such worldview of local communities provides ample opportunities to collaborate with them. The large majority of the communities would always be ready to collaborate with the officers if the officers initiate for the same. They feel overwhelmed if the officers reach out to them. Such initiative from officers changes the entire scenario in tribal areas. They should believe that officers want to conserve the environment as the way indigenous peoples want to do it.

3.2. Cultural Foundation

In India nature worship dates back to the pre-Vedic period and is based on the premise that all creations of nature have to be protected. Several plant species have been considered sacred by Indians. The communities often protect such species for collective benefits. Exploitation or overuse of the same is not allowed. Gadgil and Vartak (1975) have traced the historical link of the sacred groves to the hunting and gathering stage of societies. Hence, the concept of virgin forest exists in pre-Vedic period too. Hunting and food-gathering and pastoral economies are deeply associated with nature. The material and

non-material relevance are expressed through symbols and practices of these communities. The customary laws and other traditions are strongly influenced by their relationship with nature. Religion plays a significant role in these societies and functions as an instrument to regulate the use and management of resources. In fact, the indigenous communities treat entire nature as sacred. Besides the economic and religious significance, forest acts as a catalyst of social cohesion among those inhabitants. The hunting activities are not only aimed at subsistence but also to achieve social cohesion. Such activities are often integrated with the religious activities. For example, ceremonial hunting, collection of first flowers and first fruits are instrumental part of celebration of festivals and some rituals.

3.3. Totemic Practices

Totem is a natural object or an animal which is believed by a particular society to have spiritual significance and adopted by such community as an emblem. Totemism refers to such belief about the relationship between nature and people. Kinship is the determining factor of totems. Totem may be a spirit, an animal or a plant.

Understanding totemic practices of forest dwellers is the key to design inclusive strategies of conservation. *Kulams* (Surnames) reveal the sacred relationship between people and nature. There are chances for the success if the members of a *kulam* are taken into confidence based on totemic practices while implementing the conservation strategy for various plant species. It would contribute to the larger idea of forest conservation.

The surnames of indigenous communities known as *kulams*. But, these *kulams* of tribal communities are not equivalent to caste. They represent division but not hierarchy. They play a pivotal role in social organization of the community. *Kulam* indicate the name of a plant or an animal from which the members trace their descent. Such unit of significance bestow high priority to the totem and treat it as sacred. It is the collective responsibility of the members of a *kulam* to protect their totem. Consequently, it compels the community to conserve such species for posterity. They do not cut such plant or do not kill the animal. They take measures to protect such plant or animal. The sacred groves serve a strong evidence for the time-immemorial practice of conservation and sustainability of nature and its resources by indigenous peoples.

3.4. Sacred Groves

Hughes and Chandran define sacred groves as “segments of landscape, containing trees and other forms of life and geographical features that are delimited and protected by human societies because it is believed that to keep them in a relatively undisturbed state is an expression of important relationship to the divine or to nature” (1998: 69). The sacred groves have been a part of rich traditional and diverse culture of Indian society for many generations. They have played significant role in conservation of biodiversity. The rare, endangered and threatened plant species in the forest are well conserved in the sacred groves. The sacredness, religious beliefs and taboos around the sacred groves helped promoting sustainable utilization and conservation of flora and fauna of the region. In particular, the indigenous peoples and other traditional forest dwellers dedicate parts of the forest to the deities or ancestral spirits. They protect such patches with utmost care. These forest patches have been designated as sacred groves. One of the assumptions is that, in India, the indigenous communities were leaving a part of the forest untouched

during shifting cultivation in order to protect important flora and fauna. These areas might have developed as sacred groves. However, the communities other than those engaged in shifting cultivation also have the tradition of protecting patches of the forest for a variety of reasons. Sacred groves are not only the result of belief system but also a complex ethno-scientific thinking of the local communities. In India, sacred groves are found mainly in tribal dominated areas and are known by different names depending on local traditions and languages. They are known as *Kavu* or *Kona* in Andhra Pradesh and Telangana, *Kavu* and *Sarpakavu* in Kerala, *Kavu* in Tamil Nadu, *Devaravanaor* *Devarakadu* in Karnataka, *Sarnaor Dev* in Madhya Pradesh, *Devraior* *Deovani* in Maharashtra, *Sarnas* in Bihar, *Saranaor Jaherthan* in Jharkhand, *Orans* in Rajasthan, *Dev van* in Himachal Pradesh, *Law Lyngdohor* *Law Kyntang* in Meghalaya and *Lai umang* in Manipur. The communities might have primarily focused at preserving the scarce resources in sacred groves. These groves are collectively protected and managed by the local communities.

Gadgil and Vartak (1975) have traced the historical link between the sacred groves and the pre-agricultural, hunting and gathering stage of societies. Sacred groves have been significant from even before human being had settled down to raise livestock or till the land. The reasons for the protection of sacred groves vary across various communities in the world. Religious practices, medicinal purposes, burial grounds, watershed value etc. are important uses.

Sacred groves might have also originated as a result of its utilitarian nature, as a social institution or as a part of the taboos that evolved historically over several generations to provide a site for culturally crucial social interactions. Larger groves reduced in size over a period of time with a shift in the focus from sacred grove itself to a temple within the grove (Roy Burman 1995). Hunting of animals and birds; felling, logging of any plants and harm to any life forms are usually prohibited in the sacred groves. However, collection of medicinal plants and non-timber forest products are allowed. The religious beliefs and taboos that were central to the protection of sacred groves are being eroded over the years due to various reasons. Therefore, the present status of sacred groves is precarious. Various causes such as developmental activities, urbanization, exploitation of resources and increase in population density resulting in the pressure on the natural resources. Such forces have threatened many sacred groves of the country. Traditional mechanisms of resource management are becoming nonfunctional due to not only the increase of population but also the diversity of communities. Lack of knowledge to those communities other than traditional dwellers on sacred groves, lack of ritual association, lack of ethno-medical knowledge resulting in the decline of sacred groves.

Quick facts

There is a significant number of sacred groves in Andhra Pradesh. They are 529 in number according to World Wildlife Fund (1996).

The sacred groves are found worldwide. India has the highest concentration of the sacred groves in the world, estimated to be over 1,00,000 sacred groves (Malhotra, et al. 2007). This reflects deep connections between nature and culture.

3.5. Medicinal Uses

The traditional knowledge of indigenous communities relating to medicinal plants and their uses is a significant motivation for the conservation of nature or patches of the forest. For this very reason, indigenous or traditional medical practitioners protect several species with special attention. Few attempts were made to patent the knowledge of tribal communities with regard to medicinal uses of plants. As discussed above, the sacred groves

are the treasure house of medicinal plants. The indigenous people residing near the groves have conscientiously protected the nature's gift by intertwining the same with their traditional customs, rituals and ceremonies. Several medicinal plants that are not found in the forest are abundant in the sacred groves.

Ethno-Botanical studies of the Rudrakode sacred grove revealed the presence of 69 plant species of medicinal value that have been used by tribes (Rao and Sunitha 2011). Penusila Narasimha sacred grove or Penchalakona is the rich source of the plants with medicinal value. Around 160 plant species of medicinal value are documented from this sacred grove (Basha, et al. 2012).

Yanadis and Yerukalas of Nellore district of Andhra Pradesh collect medicinal plants from Penusila Narasimha sacred grove or Penchalakona.

3.6. Sacred Animals and their Spaces

The indigenous communities recognize the importance of several animals and treat their spaces with high priority. As their totemic beliefs indicate, each animal is protected by a small group of people as discussed above. As the boundaries of the forest are well-demarcated by the indigenous communities for human and animal life, they prefer not to disturb the zones of animals. Such belief and practice led to the conservation of forest too.

The Chenchus of Andhra Pradesh have surnames indicating the names of various animals. For example, Puli, Pulicharla and Pulsaru kulams of Chenchu indicate that they are the descendants of tiger (Apparao 2012). They do not harm tiger and traditionally vested with the responsibility of protecting this animal in Nallamala forest.

As discussed above, the forest cover is declining with the exploitation and deforestation by the external forces. As a result, the idea of reserved and protected spaces for each category of the animal species is dying out in the tribal territories. The traditional ideas need to be restored by establishing a collaborative mechanism with forest dwellers.

3.7. Identity

There is often a friction between universal approaches of conservation implemented by administrative conservators and the local practices of indigenous peoples. The concern of indigenous peoples about biodiversity is not only motivated by the desire to conserve the resources but also by the desire to live on their ancestral lands. They often want to safeguard local food security and exercise local economic, cultural and political autonomy. In fact, the conservation is a natural need to forest dwelling communities in order to protect and maintain their social, economic and political identity.

The fight of the Baigas of Madhya Pradesh to regain their traditional rights is also a fight to restore the diversity of their forests and to protect national wealth (Kothari and Desor 2013).

The modern conservationists knowingly or unknowingly fall into the western knowledge system and techno-scientific biodiversity discourse. This may create a void between the indigenous communities and the agencies representing the modern conservation technology. At this juncture, the practitioners must be cautious to avoid conflict with the local communities. Those communities must not feel that a coercive force is implementing its own strategies which may end up in non-cooperation and resistance. But, such gap can

be turned into a collaboration if techno-scientific mechanisms give due space to cultural mechanisms of conservation. In such context, building long-term partnerships with local communities is essential. The joint management mechanisms must identify all the stakeholders as equal partners.

4. Economy

4.1. Livelihood Needs

Forest is a rich reservoir of various resources. But, indigenous peoples depend on it largely for the fulfilment of livelihood needs. Their economy is generally based on the principle of limited objectives as they identify limited needs and rarely any wants. They collect Non-Timber Forest Products (NTFP) that are abundantly available and easily regenerate. They protect those species that gives precious products to supplement their economy. The intrusion of people from plains into forest areas led to deforestation. Shifting cultivation practice of a few forest dwelling communities had a negative impact on forest. But, shifting cultivation has not been irrationally practiced by tribal communities. Slash and burn may not be a good model; but, it should not be the reason to treat forest dwellers as the destroyers of forest.

The state agencies keep on exploring the strategies to minimize the environmental loss and to maximize the economic benefits for the forest dwellers. The process of exploration must ensure the sustainable use of the resources while conserving the forest. The forest department and tribal development agencies of Andhra Pradesh have taken several measures and implemented programmes in this direction in collaboration with non-government organizations. The major challenge is the continuity of such measures in order to gain the confidence of people. It is proved that the forest dwellers are often ready to accept useful strategies of conservation if they are convinced. They are ready to accept the sustainable methods of collection of any forest products.

The programmes of Government of Andhra Pradesh focused on value addition to Minor Forest Products (MFP) and their sustainable use. For example, safe and sustainable practices of gum collection and honey collection are accepted by several tribal communities of Andhra Pradesh. The programmes related to value addition to Amla and Soap nut proved very useful in maximizing the profit. Such programmes were successful in making people conscious of sustainable use of the resources.

4.2. Challenges

The conservation and the conservators have been facing several challenges. The major challenges include increasing human population, deforestation, pressure on resources, declining population of a variety of plant and animal species, commercialization of forests, changing human consumption patterns, belief systems, religious practices, invasive species and the practices of burning them, forest fragmentation, atmospheric pollution, forestry practices, changing land use practices, industrial development, urbanization and climate

The territories of indigenous groups who have been given the rights to their lands have been better conserved than the adjacent lands. (*The World Bank Report, Sobrevila 2008*).

change. It is the need of the hour to address these challenges as the global debate of environmental protection gained momentum. A harmonious multi-stakeholder system and a multi-pronged strategy are needed to address these arduous challenges. Climate

change is an overarching issue and a global challenge. It is an alarming issue in the contemporary scenario, which is often attributed to lack of conservation and failure to maintain balance in the ecosystem. The environmental factors play a cause and effect role in this context. Therefore, protection of environment and restoring the forests will deal with climate change as well. Indigenous peoples across the globe have played a key role in climate change mitigation and adaptation. Examples from Brazil, Colombia, and Nicaragua prove this (Sobrevila 2008). Making forest dwelling communities as partners in conservation and management would help in dealing with at least a few of the challenges of conservation. Recognizing the rights of forest dwellers is an important policy initiative of the government. This will lead to the conservation of the forest as the tribal communities do not aim at surplus production. Rather, they often treat the conservation of forest as a high priority aspect. The cultural dimensions in this regard are already discussed. At the same time, tribal and forest dwelling communities would be most vulnerable to the adverse effects of climate change. Therefore, a climate change agenda fully involving indigenous peoples has many more benefits than if only government and/or the private sector are involved (Sobrevila 2008). The indigenous knowledge (discussed in another unit of this Volume) of the forest dwelling communities is the rich source with many solutions to avoid or ameliorate negative effects not only on climate but also on those communities living depending on forest related natural resource base. The territories of traditional forest dwellers provide excellent examples of a landscape design and management which can resist the negative effects of climate change. Such designs were developed over centuries of experimentation by the forest dwellers. They have also developed wide varieties of medicinal and useful plants that can withstand the changes in ecological setting. All such practices of forest dwellers would lead to conservation of nature and help the authorities as well in such endeavor.

What may help in forest conservation

- Teams of community volunteers and/or elders may be formed to coordinate with forest officials in all the matters pertaining to forest conservation.
- Identify potential areas of conservation based on the beliefs of the forest dwelling communities.
- Identify rational practices of local communities while preparing manuals for conservation.
- Organize awareness programmes on the decline of the resources, need for environmental sustainability, legal provisions and consequences of environmental damage.
- Environmental education may be made compulsory at the appropriate level.
- Ensure participation of indigenous peoples in biodiversity conservation programmes.
- The expertise of indigenous peoples in managing biodiversity and natural resources help in designing more comprehensive and cost effective strategies.
- Build long-term partnerships based on mutual trust and respect with due importance to local cultures.
- A mechanism needs to be developed to deal with the emerging challenges.

5. Summary

The human beings are intricately interwoven in a sacred relationship with nature. The practical needs and sacred ideas naturally drive people to design strategies of conservation. These strategies are so designed that they have become part of everyday practices and are often inscribed in myths and folktales and objectified in symbols. In fact, these have been experimented, accepted and implemented in various ways and walks of life by the forest-dwelling communities. There are no significant evidences for the exploitation of these resources by those communities. Although there are violations, misconceptions and over-emphasis on community conservation, the very idea cannot be ruled out. The sacred groves are well maintained by the forest dwelling communities. They are treasure troves of rare species. They do not cut several plants and trees and do not kill several animals depending on their totemic beliefs. They have clearly demarcated sites for various purposes including; deities, animals, human habitat and survival. Such efficient organization of space helps in maintaining harmony with other living beings. Therefore, they are popularly known as natural conservators. Foresters and conservation institutions all across the world started recognizing the efforts of indigenous communities in the protection of nature. Several efforts are being made by the functionaries as well, especially the foresters to conserve the forest ecosystem. However, it was proved a daunting task for both the stakeholders to engage with each other in a meaningful relationship while achieving the same objective. A simple way out is to understand each other's ideas and create platforms to facilitate dialogue and partnerships. The forest dwelling communities must believe that their voice is heard. This must be the primary concern of the officers. The large majority of the communities would always be ready to collaborate with the officers if the officers initiate for the same. They feel overwhelmed if the officers reach out to them. Such initiative from the officers changes the entire scenario in tribal areas.

6. Recapitulation

- Why recognizing conservation as a time-immemorial idea is necessary?
- Why understanding the beliefs and practices of forest dwelling communities is essential?
- How do you think the techno-scientific perspective of conservation may lead to misjudging the value of traditional conservation mechanisms?
- What is the significance of sacred groves maintained by the traditional forest dwellers?
- What measures you think will motivate the local communities to help the conservation and management of natural resources?
- Why building partnerships and sustaining such partnerships by gaining the confidence of the local communities will be helpful in conservation?

7. Key Terms

Nature, Culture, Sacred groves, Totemic beliefs, Traditional Knowledge, Conservation

8. Activity

- What are sacred groves? Name a few sacred groves.
- What is the role of sacred groves in biodiversity conservation?

22 • Natural Resource Management and Biodiversity

- Name a few plant species that are considered as sacred in India.
- How do the ritual practices of tribal communities help in designing strategies for the conservation of forest?
- Develop a strategic plan for the effective partnership with local communities to conserve the forest.
- What are the key challenges in forest conservation? How do you overcome such challenges?

9. References

- Basha, S. K. M., P. Umamaheswari, E. Rajyalakshmi, M. Rambabu, & T. Pullaiah. 2012. Medicinal Flora of Penusila Narasimha Sacred Grove, Eastern Ghats, SPSR Nellore District, Andhra Pradesh, India. *Indian Journal of Fundamental and Applied Life Sciences* 2 (2): 334-344.
- Colchester, M., M. F. Ferrari, Nelson, J., C. Kidd, P. Zaninka, M. Venant, L. Regpala, G. Balawag, B. Motin, & B. Lasimbang. 2008. *Conservation and Indigenous Peoples: Assessing the Progress since Durban*. FPP series on Forest Peoples and Protected Areas, UK: Forest Peoples Programme.
- Gadgil, M, & V. D. Vartak. 1976. The Sacred Groves of Western Ghats in India. *Economic Botany* 30: 152-160.
- Hughes, J. D., & M. D. S. Chandran. 1998. The Sacred Groves around the Earth: An Overview. Vol. 44, In (Eds) Ramakrishnan, P.S, K. G. Saxena and U. M. Chandrashekara. *Conserving the Sacred for Biodiversity Management*. New Delhi: Oxford & IBH.
- Kothari, A., & S. Desor. 2013. Baigas' Battle. *Frontline*, May 1.
- Malhotra, K. C, Y Gokhale, S Chatterjee, & S Srivastava. 2007. *Sacred Groves in India*. New Delhi: Aryan Books International.
- Rao, B. R. P., & S. Sunitha. 2011. Medicinal Plant Resources of Rudrakod Sacred Grove in Nallamalais, Andhra Pradesh, India. *Journal of Biodiversity* 2 (2): 75-89.
- Roy Burman, J. J. 1995. The Dynamics of Sacred Groves. *Journal of Human Ecology*. 6: 245-254.
- Sobrevila, C. 2008. *The Role of Indigenous Peoples in Biodiversity Conservation: The Natural but Often Forgotten Partners*. Washington: The World Bank.
- World Parks Congress. 2003. *The Durban Accord*. Accessed January 5, 2018. www.iucn.org/wpc2003.

3

Indigenous Knowledge of Tribals on Forest Products and Bio-Resources

"The prevailing attitude has been that Western science, with its powerful analytical tools, has little to learn from tribal knowledge. The developed world's disastrous mismanagement of the environment has somewhat humbled this arrogance, however, and some scientists are beginning to recognize that the world is losing an enormous amount of basic research as indigenous peoples lose their culture and traditions. Scientists may someday be struggling to reconstruct this body of wisdom to secure the developed world's future" (Linden 1991).

Source:

Linden, Eugene. 1991. Lost Tribes, Lost Knowledge. *Time*. September 23, pp. 46-54.

- *Do you agree with above observation?*
- *If there is a need for protecting indigenous knowledge, do you think the time is running out?*

Contents

1. Introduction
2. Learning Objectives
3. What is Indigenous Knowledge?
4. Why is Indigenous Knowledge Important?
5. Diverse Ways of Living and Knowledge
- 5.1. Case: Diverse Foods and Knowledge
6. Diversity of Forest Resources and Indigenous Knowledge in India
7. Indigenous Knowledge of Konda Reddis on Forest Products and Forest Bio-Resources
- 7.1. Dominant Domains of Forest/Plant Resources and Knowledge
- 7.2. Indigenous Knowledge on Plants for Economic and Survival Needs
- 7.3. Some Specific Plants of Cultural Significance
- 7.4. Plants for Forecasting Rain
8. Indigenous Knowledge of Other Tribes on Forest Resources/Products
9. Market-Oriented Developmental Intervention, Forest Resources and Indigenous Knowledge
- 9.1. Case: Resource Depletion Affecting the Practice and Knowledge of Herbal Medicine
10. Biological and Cultural Diversity and Indigenous Knowledge
- 10.1. Indigenous Peoples Perception of Nature -People as Part of Nature
- 10.2. Sacred Groves
11. International and National Policies on Indigenous/ Traditional Knowledge
- 11.1. United Nations Convention on Biological Diversity, 1992
- 11.2. The Biological Diversity Act, 2002
- 11.3. The Draft National Tribal Policy, 2006
12. Intellectual Property Rights for Indigenous Knowledge
13. Documentation of Indigenous Knowledge
14. Summary
15. Recapitulation
16. Key Terms
17. Activity
18. References

1. Introduction

Indigenous knowledge, also called as traditional knowledge, is a vital human/natural resource that was undervalued earlier. There is a growing interest on such knowledge since the 1980s among the researchers, international organizations, public agencies, and among the indigenous peoples themselves for its relevance in different ways. For researchers and multilateral organizations, it is still an underutilized or untapped resource. Indigenous knowledge has value in many ways for the indigenous/tribal society, in which it evolves. For planners and officials working in the tribal areas, it helps improve local conditions there. It has also relevance for environment and humanity at large. Also, it is now recognized that the exclusive dependence on modern science leads to socio-ecological problems. Therefore, there is a rising appreciation of its value and concern for its revival. Nevertheless, it is not an alternative or substitute to modern scientific knowledge. It is to point out that judicious and appropriate application of the indigenous knowledge continues to be relevant in certain degree even in modern times. But, indigenous knowledge is rapidly eroding due to various reasons, and so a demand for its documentation and revival. Several international and national policies and bodies also recognized the need to respect, preserve, conserve and maintain such knowledge, innovations and practices of tribal communities. In this background, this unit is intended to explain the breadth and depth of indigenous knowledge of tribals in general and on forest bio-resources and bio-resource products in particular.

2. Learning Objectives

At the end of this unit, the reader is expected to know about:

- 1) The concept and relevance of indigenous/traditional knowledge,
- 2) Diversity of cultures and forest resources and indigenous knowledge,
- 3) Tribal knowledge on forest products and forest bio-resources,
- 4) Bio-cultural diversity and indigenous knowledge,
- 5) Existing international and national policies on indigenous/traditional knowledge, and
- 6) The need of documentation and maintenance of indigenous/traditional knowledge.

3. What is Indigenous Knowledge?

Indigenous knowledge is also known synonymously as traditional knowledge or local knowledge. It is the knowledge that people in a given community have developed over time, and continue to develop. It can be understood simply as the knowledge of indigenous/tribal people. It refers to the knowledge, practice and belief of indigenous/tribal communities. It is developed based on experience and often tested over the generations of use and adapted to the local culture and environment. It is transmitted orally from generation to generation. It is unique to every culture or society. It also gives identity to the community as possessors of such knowledge.

Indigenous knowledge (IK) can easily be understood through various domains/sectors such as agriculture, healthcare, and natural resource management. In the domain

of agriculture, IK is clear in crop diversity, intercropping techniques, seed varieties, seed treatment and storage methods, pest control, etc. In the domain of natural resource management, IK can be seen in sources and qualities of raw materials and products, use of forest plants/products and animals, and underutilized plants and products.

4. Why is Indigenous Knowledge Important?

The relevance of IK can be understood at three different levels: 1) for local/tribal communities, 2) for the environment, and 3) for humanity/society.

- 1) For local communities: It is closely related to survival and subsistence. It is easily available, accessible, affordable for the people to eke out their livelihood, and sustainable for them. IK provides problem-solving strategies for tribal communities.
- 2) For the environment: Indigenous knowledge helps shape perceptions of environment and society. It helps design ways to conserve biological diversity and natural resources (e.g., sacred places and sacred groves). IK contributes to research in forestry, botany, zoology, pedology, etc.
- 3) For humanity/society: It can contribute to science (e.g., herbal medicine and veterinary medicine). It is valuable to modern industry and agriculture. It can be preserved, transferred, or adopted and adapted elsewhere. It can help reduce poverty and contribute to sustainable development.

5. Diverse Ways of Living and Knowledge

Most of the tribes have been traditionally dependent on natural resources for their survival in several ways. Their close association with the forest and forest resources ranges from gathering of forest produce, hunting of wild animals, trapping of birds and animals, pastoral activities, shifting cultivation, etc. They depend on the forest not just for food or food production, but various other purposes such as to using of materials in preparing tools and crafts for procurement and consumption of food, materials for shelters, medicine, firewood, poison, rituals, etc. Forest and plants are perceived as vital not only for survival and subsistence needs, but they also have invaluable socio-cultural, religious and symbolic significance. Thus, they are invariably interrelated with life, livelihood, and knowledge of the tribes.

Since the tribes live in different ecological zones and differ widely in their socio-economic and means of living, their understanding, thinking and knowledge of nature that are relevant to them in their specific context also vary. Thus, different cultures/communities construct knowledge differently through diverse ways of living. What is relevant to a community that depends on their culture and environment, may not be relevant to other communities that differ in cultural and environmental contexts.

5.1. Case: Diverse Foods and Knowledge

Some cultures view the consumption of some foods to be a part of their traditional cuisine, while others consider the same to be inappropriate and offensive. For example, for the Konda Reddis of Andhra Pradesh, *pullacheemalu* (a type of ants) is a food source. They

use them and their eggs as curry and chutney. These are available in the forest, in nests made of leaves on the plants. Similarly, many traditional cultures consider insects to be food resources, while most non-tribal and urban populations consider them pests. The food value of these organisms does not change, only the opinion and use of them. Other such examples of non-vegetarian food include crabs, beef, pork, meat of dog, etc. In some places like Mizoram and Nagaland, dog meat is as regular as pork, chicken and mutton. Rodents, monkeys and donkeys are not only edible but also have medicinal value in several East Asian countries.

Regarding the vegetarian food, the consumption of rice versus millets depends on environmental and cultural factors. The tribes in Andhra Pradesh, most of them inhabit hilly-forest regions, traditionally depend on shifting cultivation and grow various types of millets, besides rice. The millets include *sama* (little millet, *Panicummiliare*), *kora* (foxtail millet, *Setaria italica*), *jonna* (jowar, *Sorghum bicolor*), *gantelu* (pearl millet, *Pennisetum typhoideum*), *tsollu/chollu/chode* (finger millet, *Eleusine coracana*), and *bontha* (barnyard millet, *Echinochloa frumentacea*).

6. Diversity of Forest Resources and Indigenous Knowledge in India

Forests sustain enormous amount of biological diversity and the associated knowledge is highly variable in India. That means, forest resources may vary in range and degree from region to region, as well as their importance to the local people. What is relevant and/or available for some tribes may not be relevant and/or available for others. For instance, the *jeelugu* (fishtail palm, *Caryota urens*) is found in cold climatic regions such as Maredumilli, and *tati/tadi* (palmyra palm, *Borassus flabellifera*) in dry climatic regions of East Godavari, Andhra Pradesh and elsewhere. They are known for their sugary saps. The plant of *arogyapacha* (*Trichopus zeylanicus* ssp. *travancoricus*) of Kani tribe in Kerala widely known for its health benefits, exists in the forests of Agasthyamalai hills in the Western Ghats only. This locality has one of the most diverse biological resources in the region.

The same species may be known by different names at different places. For instance, *seetamma talakattu* (*Asparagus racemosus*) is also referred as *seetamma chettu*, *seetammajada*, *pilliteegalu*, *pilligaddalu*, *chandamamagaddalu*, and *shatavir* in different areas. *Gesari* (*Hesperuthus acrenulata*) is also known as *torrivelaga*, *tirumanu* (*Anogeissus latifolia*, axlewood) as *velama* and also *chirumanu*, and *kodipuruteega* (*Tinospora cordifolia*) as *tippateega*. The underlying factors for such variation are related to geo-cultural specificity. These include the geographical distribution of the plant and intensity of human interaction with the plant. The relevance of same species may also vary depending on the geo-cultural contexts. This is particularly evident from various studies on indigenous knowledge of medicinal plants among the tribes in India. In other words, indigenous knowledge exists in relation to the local environment.

7. Indigenous Knowledge of Konda Reddis on Forest Products and Forest Resources

The forest-dependent tribal communities are endowed with profound knowledge of the forest products and forest resources (wild plants and animals). The knowledge of tribes

on forest resources is not only vast and diverse, but each tribal community has rich knowledge of forest. In view of this, the indigenous knowledge of tribes about the forest resources/products with a special focus on the Konda Reddis of Andhra Pradesh is discussed here.

7.1. Dominant Domains of Forest/Plant Resources and Knowledge

The Konda Reddis possess in-depth knowledge about certain domains of forest/plants, which have wide significance in their daily life. Their dominant domains of plants/knowledge include: 1) *makulu* (woody plants), 2) *dumpalu* (tuberous plants), 3) *aaku-kuralu* (leafy-vegetables), 4) *kokkulu* (mushrooms), 5) *pidalu* or *vedurlu* (bamboos), 6) *mandu-mokkalu* (herbs/medicinal plants), 7) *narachetlu* (fiber plants), 8) *aakulu* (leaves/leaf plates), 9) *donka* (unwanted weeds), 10) poisonous and harmful plants, 11) trees not cut/used as firewood or for other purposes, 12) socio-religious uses of plants (plants for marriages/festivals/funerals).

Under each domain, Konda Reddis identify and classify many varieties of plants. For example, in the domain of bamboos, Konda Reddis can identify and classify more than six types of bamboos.

7.1.1. Case: Knowledge about Bamboos

The Konda Reddis call bamboos *vedurlu* and also *pidalu* in the local language of Telugu. The bamboos grow in different places. The tribal community recognizes and identifies at least six types of them. These are *jaraveduru* (*Dendrocalamus hamiltonii*), *kondaveduru* (*Dendrocalamus strictus*), *mulasaveduru* (*Bambusa arundinacea*), *pachchaveduru* (*Bambusa vulgaris*), *sensuveduru*, and *vudikaveduru*. Such identification and classification reveal the significance of bamboos for the Konda Reddis. Bamboos are significant for the *pidem-kommulu* (bamboo-shoots), which are used for making curries. Bamboos are also significant for their *ghataka* (bamboo rice), which are said to be used for making food. But, all bamboos do not produce rice. *Jara* and *mulasa* bamboos only produce rice. But, it is not frequent as they produce crops once in 40 years. *Konda pidem* also crops, but its rice is very small and not useful. Among the bamboos, *konda* and *jara* are predominantly available in Rampachodavaram Agency. But, Konda Reddis also collect other types of bamboos since they have a specific use. The details of different kinds of bamboo are as follows:

- 1) *Jaraveduru/pidem* (*Dendrocalamus hamiltonii*): It grows on the banks of streams. It is used for arrows and *mittas* (which are arrows used for hunting birds), because, the space in-between the nodes is long. It is straight, light weight and strong when compared with *konda* bamboo. Thin strips or slivers (*eenebaddalu*) of the *jara* are also used in stitching the leaf-plates.
- 2) *Konda veduru* (*Dendrocalamus strictus*): It is the hill bamboo. It is used for house construction, wattle preparation, making of mats, winnowing fans, different varieties of boxes, etc. It is also used for the cord of a bow.
- 3) *Mulasaveduru* (*Bambusa arundinacea*): It is spiny (thorny) unlike other bamboos. It is hollow and thick in size. It is used for making *guntalu* (hollow holders), which are specially used for collecting toddy from toddy-trees. *Guntalu* are also used, besides the vessels of the bottle-gourd (*dippalu*), for storing and

carrying semi-liquid food or water. It is also used for making furniture by some Konda Reddi craftsmen, as the matured stems are very thick and strong.

- 4) *Sensuveduru*: It is used for making bows and *kavadi* (yoke), because of its sturdiness, thickness and lengthy inter-nodes.
- 5) *Vudikaveduru*: It is reddish, thin and has lengthy inter-nodes. It is said that the stems of this bamboo are useful for making handles for a type of carry bags.
- 6) *Pachcha* (*Bambusa vulgaris*): It is also called as golden bamboo, and grown for its beauty or ornamental value.

Bamboo-Chicken from *mulasaveduru* (*Bambusa arundinacea*)

The bamboo of *mulasaveduru* (*Bambusa arundinacea*) is only used for cooking “bamboo- chicken”, a popular recipe from tribes, in the Agency areas of East Godavari and Visakhapatnam districts in particular. This recipe is also served at the International food festival of Telangana State held in Hyderabad recently. It is said that this recipe was originally from Rampachodavaram area, and later it spread to Araku and other Agency areas.

7.1.2. Case: Knowledge about Mushrooms

Similar to bamboos, Konda Reddis can identify and classify mushrooms (*kokkulu*) into five categories based on the place of growing, size, colour, edibility, etc. These are: 1) *puttakokkulu*, 2) *nelavelugulu*, 3) *pidimkokkulu*, 4) *karrakokkulu*, and 5) *verrikokkulu*. Konda Reddis have in-depth knowledge about each category of mushrooms.

7.2. Indigenous Knowledge about Plants for Economic and Survival Needs

Indigenous knowledge of Konda Reddis can also be understood from the plants they use for the economic and survival needs. The details are as follows.

7.2.1. Minor Forest Produce

Forest produce and resources are generally classified into two main categories: timber-based and non-timber based resources. The non-timber or non-wood forest products are also known as minor forest produce (MFP), as they are harvested in small quantities. According to the “Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006”, “minor forest produce” includes all non-timber forest produce of plant origin including bamboo, brush wood, stumps, cane, tussar, cocoons, honey, wax, lac, tendu or kendu leaves, medicinal plants and herbs, roots, tubers and the like.

In Andhra Pradesh various minor forest produce are purchased by the Girijan Cooperative Corporation (GCC, and locally called as Corporation). Among them, the Konda Reddis and other tribals in the Rampachodavaram Agency area collect the following products: the bark of the *rella* (*Cassia fistula*) and *naramamidi* (*Litsea decanensis*), gum of the *kovela* (*Sterculia urens*), stems of the *kodipuruteega* (*Tinospora cordifolia*), fruits of the *karaka* (*Terminalia chebula*) and *usiri* (*Phyllanthus emblica*), seeds of *nallajeedi* (*Semecarpus anacardium*) and *musini* (*Strychnos nux-vomica*), the grass of

kondacheepuru (hill broom), and tamarind (*Tamarindus indica*). Sometime back GCC also purchased the seeds of *pandruka/sindhuram/bottuchettu* (*Mallotus philippensis*), and *pulabodhi* (*Acacia caesia*). The grass of broom stalk is available mainly in the hilly area of Maredumilli in Rampachodavaram Agency which the tribes collect and sell at the GCC. The Konda Reddis of Chintur area collect wax also. The above MFP and the tamarind (*Tamarindus indica*), most of which is from the domesticated trees, give a good yielding annually. The GCC also purchases seeds of the *jabaru/jabra(l)* (*Bixa orellana*), which is introduced by ITDA to tribes two decades ago or so to grow in their homestead lands. Though the GCC has a monopoly of purchasing all the MFP, certain products of tamarind and hill broom stalk/grass are purchased also by the merchants privately. However, the tribals should be allowed to sell MFP to private traders if they offer a better price than that of GCC, and the monopoly of GCC should be diluted to that extent by passing an executive order by the Govt. GCC should come to the rescue of tribals only to prevent distress sale and exploitation by private traders.

7.2.2. Plants for Dyes

According to Konda Reddis, dyes can be extracted from the seeds of the *pandruka/sindhuram/bottuchettu* (*Mallotus philippensis*), *jabaru/jabra(l)* (*Bixa orellana*), *nallajeedi* (*Semecarpus anacardium*), *musini* (*Strychnos nux-vomica*), *chinta* (*Tamarindus indica*); from the fruits of *tummiga/tumma/tuniki* (*Diospyros melanoxylon*), and *mollika*.

Bottuchettu got the name since the surface of its fruits are red and used as vermilion to put *bottu* (bindi or spot) on the forehead by women.

7.2.3. Plants as Fish-Poison

One of the easy technique of catching fish in a pond/streamlet is poisoning the water. The tribal communities use the fruits of the *kona/jirumudu* (*Casearia elliptica*), *vasaka*, *chilla* (*Strychnos potatorum*), and bark of the *gaka/gatha* (*Diospyros sylvatica*) for this purpose. These are used by mixing up with other ingredients like red-soil. When such material is thrown into water, it de-regulates the vision and sensation of the fish. So, they cannot move and float on the water. Therefore, it is not in fact, poisoning the fish, but make them lose consciousness and become immobile. Then these are caught by hand.

7.2.4. Plants for Catching of Birds

The Konda Reddis possess an extensive knowledge and skill of using plants in catching birds. In catching birds, they use materials of plants such as, *panasa* (*Artocarpus heterophyllus*), *nallajeedi* (*Semecarpus anacardium*), etc. The sticky juice collected from the *panasa* fruits and the *cheedi* collected from seeds or stem of the *nallajeedi* are mixed and used as an effective material for catching birds.

7.2.5. Plants as Forages

According to Konda Reddis *pillidumpa* (*Pueraria tuberosa*) is a big tuber, which is similar in size to pumpkin. It is also known as *nelagummadi* and *adavigummadi* in other areas of the Agency and has medicinal properties. It is a delicious food for wild boars, which also eat the tubers of *naradumpa*, *chedadumpa*, and *pidem-kommulu* (bamboo shoots).

The Konda Reddis are great observers of the behavior of the wild animals. For instance, they say, wild sheep (deer), hedgehog, and *vedirelakalu* eat *vusirikayalu* (fruits of *Phyllanthus emblica* or *Emblica officinalis*). Monkeys and *bandalu* eat *busi* fruits (*Schleichera oleosa*). Deer eat fruits of *neredu* (*Syzygium cumini*). *Kancherapittalu* (birds) eat *raksha* fruits, and wild-boar eat fruits of *ravada* (*Dillenia pentagyna*).

7.2.6. Tooth Sticks

Konda Reddis use sticks of *kona* (*Casearia elliptica*), *kondavepa* (*Melia Azdirachta*), *vepa* (*Azadirachta indica*), *ganuga* (*Pongamia pinnata*), *barnika* (*Streblus asper*), *podarilaka*, and *yerradutchari* as *pandupulla* (tooth stick) for brushing their teeth. The sticks possess different tastes. Selection and use of them depend on their availability at the nearby place of the user. However, *podarilaka* is a special plant. Its stem has a taste of peppermint. It is occasionally used, especially by patients, who suffer from fever and who feel their mouths are tasteless.

7.2.7. Plants Used in Drinks

The Konda Reddis use roots of *sugandhipala* (*Hemidesmus indicus*) for making modern coffee/tea-like drinks. They use the bark of *gesari* (*Hesperethusa crenulata*), roots of *rella* (*Cassia fistula*), etc. in the toddy for making it hard or strong drink. As already mentioned, they use saps of *jeelugu* (fishtail palm, *Caryota urens*) and *tati* (palmyra palm, *Borassus flabellifera*) as toddy, traditional drink(s). The Koyas of Chintur and Bhadrachalam Agency areas use the flowers of *ippa* (Mahua, *Madhuca longifolia*) for making toddy.

7.2.8. Plants for Wrapping

Leaves of *adda* (*Bauhinia vahlii*), palmyra palm, *pala* (*Holarrhena antidysenterica*), *tumma* (*Diospyros melanoxylon*), etc. are used for wrapping of certain items for different purposes and contexts. These are mainly used among others. Among all, the leaves of *adda* are mostly used for packing and storing food.

7.2.9. Plants for Basketry

Baskets are made of bamboos. There are different types of baskets in different sizes and for different purposes like *buttalu*, *palikalalu*, *kimmalu*, etc., for keeping, carrying, and storing of materials; *kolla-jabu/butta* for keeping the poultry. Winnowing-fans, mats are also made with bamboos. Generally, all of them are made of *kondaveduru* (*Dendrocalamus strictus*). But, *jaraveduru* (*Dendrocalamus hamiltonii*) can also be used to some extent, if *kondaveduru* is not available for any reason. However, strips of *kodipuruteega* (*Tinospora cordifolia*) are also used for binding in the winnowing fans.

Bamboo Box

Prathanam-pette among Konda Reddis is an innovative and artistic item of bamboo. It is like a box, in a rectangle and flat shape. It is used during the marriage, for keeping and carrying the bridal wears. It exists as a rare art for now among few craftsmen in very few interior villages of Rampachodavaram Agency area. It is about to disappear shortly.

7.2.10. Fruits

The category of fruits is an important domain of knowledge among tribal children in particular. Fruits that are mostly available and used by the tribals include, *mamidi* (mango, *Mangifera indica*), *panasa* (jackfruit, *Artocarpus heterophyllus*), *usiri* (*Phyllanthus emblica*), *seethaphalam* (custard apple, *Annona squamosa*), *ramphalam* (bullock's heart, *Annona reticulate*), *neredu* (*Syzygium cumini*), *cheedi* or *nallajeedi* (*Semecarpus anacardium*), *jeedimamidi* (cashew, *Anacardium occidentale*), *mullapandlu* or *parimi* (*Ziziphus oenoplia*), *chitteetha* (*Phoenix loureirii*), *peddaeetha*, *bodda* (fig), *mollika*, *busi* (*Schleichera oleosa*), *thumma* (*Diospyros melanoxylon*), *cheepidi*, *pandrika* (*Mallotus philippensis*), *pullajavida*, *balli*, *gaviri*, *kummara*, *maredu* (Bael, *Aegle marmelos*), *papidi*, *vanga*, etc.

7.2.11. Seeds or Nuts

The Konda Reddis, particularly the children eat the *pikkalu* (seeds or nuts) of certain plants. These include *adda* (*Bauhinia vahlii*), *tangedu* (*Xylia xylocarpa*), *nallajeedi* (*Semecarpus anacardium*), *panasa* (jackfruit, *Artocarpus heterophyllus*), and cashew nuts. In the past, Konda Reddis also used the mango kernels and tamarind seeds for preparing porridge, particularly during the times of food scarcity.

7.2.12. Knowledge about Medicinal Plants

The Konda Reddis and particularly the specialists of herbal medicine say: “all plants of the forest are medicinal plants to knowledgeable persons”. It reveals the variations in knowledge and significance of plants. Medicines are extracted from *mokkalu* (small plants, herbs), *teegalu* (creepers/climbers), *chetlu* (trees), *ranalu* (parasites), etc. from bark, roots, leaves, fruits, seeds, flowers, and stem. Some of the important medicinal plants among the Konda Reddis are as follows: *naramamidi* (*Litsea decanensis*), *gesari* or *torrivelaga* (*Hesperethus acrenulata*), *seetamma talakattu/jada* (*Asparagus racemosus*), *mullatamara* (*Smilax zeylanica/macrophylla*), *peddamanu* (*Ailanthus excelsa*), *sugandhipala* (*Hemidesmus indicus*), *rella* (*Cassia fistula*), *verrideyyam* (*Gloriosa superba*), *tellachitramulam* (*Plumbago zeylanica*), *errachitramulam* (*Plumbago indica*), *karaka* (*Terminalia chebula/Chebula myrobalan*), *kodipuruteega* (*Tinospora cordifolia*), *bommala marri* (*Clerodendrum serratum*), *chittiamudamu* (*Ricinus communis*), *barnika* (*Streblus asper*), *maredu* (*Aegle marmelos*), *ganuga* (*Pongamia pinnata*), *billi* (*Chloroxylon swietenia*), *kona* (*Casearia elliptica*), *nallajeedi* or *cheedi* (*Semecarpus anacardium*), *musini* (*Strychnos nux-vomica*), *tani/ta(n)di* (*Terminalia bellerica*), *vodisa* (*Cleistanthus collinus*), *pulabodhi* (*Acacia caesia*), *podarilaka*, *yerradutchari*, and *dudippa*.

7.3. Some Specific Plants of Cultural Significance

There are some plants that are very significant for Konda Reddis in various ways. These include: 1) *Jeelugu* (sago-like palms, *Caryota urens*), 2) *Tati* (palmyra palm, *Borassus flabellifera*), 3) *Gummudu* (*Gmelina arborea*), 4) *Vegisa* (*Pterocarpus marsupium*), 4) *Billa* (*Chloroxylon swietenia*), 5) *Eerudu/Erugudu-cheva* (*Dalbergia latifolia*), 6) *Adda* (*Bauhinia vahlii*), 7) *Chilla* (Induga, *Strychnos potatorum*). Each of these plants are culturally and economically important.

7.3.1. Case: Billa (*Chloroxylon swietenia*)

It is also called as *billi* or *billudu*. Its wood is light yellow in colour. The wood, particularly the heartwood is extremely hard and durable. It is used for making agricultural implements such as *nagali* (plough), *medu* (a pole on the plough), *poodu* (yoke of oxen), *baaditha* (a tool with big wooden handle and sharp iron piece at the end used for making implements); *tulalu* (beams) and poles in house construction, etc. It is also used for making *gutam* (crushing sticks) and *peetalu* (stools, a stool is a simple seat with short legs but without a back or arms) for crushing *baligelu* (petioles of palmyra leaves) to make *tatipeechu* (fiber of Palmyra). Leaves are used to make smoke to drive away or kill the leeches on the cattle, and as mosquito repellents in some areas.

The tree has a significant value commercially and medicinally. It is the only wood that is used for cutting board for chopping chicken, mutton and any other meat by butchers in meat shops anywhere in urban or rural areas of Andhra Pradesh. Because its wood does not get affected by knives and is also not vulnerable to the attack of worms and termites. Scientific experiments on this plant in the recent past proved that its oil has the property of anti-insecticide, anti-bacterial and anti-fungal, and mosquito repellent.¹ The indigenous knowledge of tribes only stimulated such experiments. A botanist who visited a tribal area in Telangana's Warangal district found the garlands of leaves hung on the doorframes of some houses. When he enquired about the leaves, the tribes informed him that those were *billa* leaves used to ward off the mosquitos.

7.4. Plants for Forecasting Rain

The Konda Reddis believe that the rain can be forecasted by observing the developments and changes in some parts of certain plants. Such meteorological plants include: 1) *moduga* (*Butea superba*), 2) *vodisa* (*Cleistanthus collinus*), 3) *seetammatalakattu* (*Asparagus racemosus*).

8. Indigenous Knowledge of Other Tribes on Forest Resources/Products

As already mentioned, similar to the Konda Reddis, other tribal communities have also indigenous knowledge on various domains. Their immense knowledge is particularly known in the forested areas based on the nature of resources. For instance, the Chenchus in Nallamala forest region of Andhra Pradesh and Telangana are experts in hunting and related knowledge. The expert Chenchu hunters are knowledgeable in animal ethology. They can identify animals from their footprints, faecal matter and certain other indications. They know the animals' food habits, mating seasons, aggression periods, etc. Such knowledge not just facilitates them for hunting, but also prevents them from meeting dangerous animals like tiger, panther and bear. The Chenchus are also experts in the honey collection, which is a difficult task, unlike other pursuits of food gathering. Honey is collected from beehives located on trees, bushes, furrows, anthills, cliffs and gorges. It requires skill and expedient material for operation of the activity, and it is sometimes a

¹ Ravi Kiran, Suripeddi. 2005. *Studies on Chemical Constituents of Chloroxylon swietenia DC. With Reference to Essential oils*. Unpublished Ph.D. thesis submitted to the Department of Botany, Osmania University, Hyderabad.

hazardous expedition too. The Chenchus have developed notable techniques of honey collection and to overcome difficulties in reaching the beehives. The Chenchus have also knowledge in the collection of certain other minor forest products such as mushrooms, gum, nux-vomica seeds, and *maredugeddal* roots (*Decalepis hamiltonii* Wight & Arn.).

Nannari Sharbat/Health Drink

Nannari Sharbat/health drink is prepared from the roots of *maredugeddal* (*nannari*) (*Decalepis hamiltonii* Wight & Arn.) collected by the Chenchu tribals from the forests of Nallamala, Andhra Pradesh. It is a product of the Girijan Co-operative Corporation Limited, Andhra Pradesh; it is called as summer drink of the South. It is mentioned that this Sharbat is a body coolant in summer and anti-dehydrator; it also purifies the blood, cures urinary tract infections and constipation, improves digestion, prevents stone formation in the glands and bladder and also controls transilitis. Such advantages make this natural and organic Sharbat a perfect addition to summer drinks.

9. Market-Oriented Developmental Intervention, Forest Bio-Resources and Indigenous Knowledge

The Girijan Cooperative Corporation (GCC) was established by the Government of Andhra Pradesh in 1956 to: undertake the guardianship of the tribal peoples by purchasing MFP from them at reasonable prices and to protect them from exploitation by middlemen and petty traders, who try to purchase their produce at low (or below market) prices, and establish a mutually beneficial relationship between them and rest of the world. Consequently, the GCC was given a monopoly over the purchase of all items of the MFP. However, the GCC, like any other commercial agency, purchased some products of MFP at low prices, the act of which increased pressure on the tribal people to find ways for making a living. As a result, they harvested resources indiscriminately to meet their subsistence needs. This has resulted in “over exploitation” and depletion of resources. In other words, the monopoly of the GCC over the collection of MFP and their market (procurement) prices has led to “over exploitation” of the MFP, which were already dwindling due to growing pressures on forest-lands for cultivation. Such “over exploitation,” subsequently, resulted in the depletion of those forest resources, and dwindling resources worsen the situation. This dynamic has already destroyed many trees belonging to the *naramamidi* (*Litsea decanensis*) and *rella* (*Cassia fistula*), and has made them endangered. In particular, the *naramamidi* tree is considered to be on the verge of extinction. This depletion or loss of resources has, in turn, hindered the practices related to them and has decreased learning opportunities. Species scarcity may also be affecting knowledge relating to that species. The following case exemplifies this situation.

9.1. Case: Resource Depletion Affecting the Practice and Knowledge of Herbal Medicine

An old man (aged 60 years) from Konda Reddis says: “I am an expert in *chekkamandu* [herbal medicine] for treating bone fracture, sprains, and certain bone-related pains. I fell down a couple of days ago and have back-pain. But I could not treat myself, even though I know the effective treatment. Because, the treatment requires the bark of the *Naramamidi*

tree, and the bark is not available as the trees are destroyed because of its high demand by the GCC and over-exploitation of the resource by the people. So, I was left with no other alternative than going to the hospital Thus, I had to spend some amount of money unnecessarily for the English medicine, instead of using my own effective treatment, because of lack of the local resource, the bark of *Naramamidi*" (Kodirekkala 2015). This case illustrates how the market-oriented developmental initiative in the form of the GCC has affected forest resources and the knowledge related to them.

Such trends ultimately end up with loss of knowledge about those resources. Therefore, the survival of indigenous knowledge depends on the survival of the local resource and vice versa.

10. Biological and Cultural Diversity and Indigenous Knowledge

There is an interrelation between biological diversity, cultural diversity and indigenous knowledge. India is one of the biological diversity (or biodiversity) rich countries as it has diverse geo-climatic regions and cultures. Biodiversity provides the base for cultural diversity with diverse ecological conditions. It is inextricably linked with the local/indigenous/tribal people, who derive their livelihood directly from nature. They are wholly dependent on the biodiversity for survival. Biodiversity also provides insurance against their future. However, many indigenous/tribal peoples are considered to have managing diversity in productive ways with their intimate links with nature. Most of their cultural practices have tremendous effects in promoting conservation. Therefore, biodiversity and cultural diversity are intimately linked.

Nevertheless, biodiversity is eroding due to various reasons. These include: commodification and "over-exploitation" of resources for the market, emergence of monoculture plants over species diversity, among others. The loss of biodiversity also results in the disappearance of cultural diversity since both are intimately linked. For example, the unavailability of certain plant species in close vicinity imposes restriction on using of those resources. However, since biodiversity protects the livelihood systems of different communities, it needs to be incorporated into the production processes in agriculture and forestry as well.

10.1. Indigenous Peoples Perception of Nature – People as Part of Nature

In many indigenous populations, humans are considered to be an intrinsic part of the nature in the same way as other components of nature such as, animals, plants, etc. For example, the Pygmies of the Congo (formerly Zaire) say "The forest is a father and a mother to us, ... and like a father or mother it gives us everything we need – food, clothing, shelter, warmth ... and affection. Normally everything goes well, because the forest is good to its children" (Turnbull 1962:92). Similarly, the Konda Reddis of Andhra Pradesh believe that earth is the mother and sky is the father and all of them (and all human beings) are their children. They also say that the forest, which is the shelter of plants, animals and spirit forms, is also created by the mother-earth. This is with the help of the father-sky, who is considered responsible for the rains and protective-shield from other powers including sunlight. Konda Reddis also believe that human beings and other non-human forms including plants, animals, spirits, etc. are created by the same divine power and are

believed to be bound by a common kinship bond of brotherhood. Konda Reddis annually conduct festivals for hilly-forest spirits/gods for their protection when the former were in the forest, and to avert any misfortune.

Thus, many tribal communities and nature are traditionally interdependent. Most of the tribals live in harmony with nature. They believe that nature is to be preserved and cared for. One must take only what one really needs, whether it is food, water, or some other resource. In some cultures, this value is carried to the extent of apologizing to nature when one takes something from it.

10.2. Sacred Groves

Sacred groves comprise of patches of forests or natural vegetation ranging from a few trees to several acres of forests. They are usually dedicated to local deities or spirits (ancestral, tree, or other). These groves are protected by local communities because of their religious beliefs and cultural practices such as the abode of local deities, a site for community ritual, etc. In India, they are found all over the country and mainly in tribal dominated areas.

The sacred groves serve as valuable repositories of biological (floral and faunal) diversity that have been conserved by local communities for generations in a sustainable manner. They are the important places in which biodiversity is protected/preserved in mostly undisturbed natural condition through social taboos and sanctions that reflect the spiritual and ecological ethos of the local communities. They help to preserve the representative genetic resources existing in the surrounding regions for generations. They act as traditional sanctuaries for rare and endangered species of flora and fauna. Thus, sacred groves are significant traditional practices of biodiversity conservation. They have also significance for the cultural and religious life of local communities.

For instance, in North-Eastern India, many sacred groves were reported from Meghalaya, Manipur, and Assam. The Meghalaya's Khasi, Garo and Jaintia tribes have designated certain patches of forests as sacred groves based on their traditional beliefs and customary practices.

They are protected from any product extraction by the community. Such forests are not only rich in biological diversity, but harbor many endangered plants and herbs. Thus, they have a tradition of environmental conservation. Similarly, the tribal communities in Manipur, Assam and Arunachal Pradesh have preserved and protested forest patches.

11. International and National Policies on Indigenous Knowledge

11.1. United Nations Convention on Biological Diversity, 1992

The Convention on Biological Diversity (CBD), which was adopted at the United Nations Conference on Environment and Development (UNCED) (the Rio "Earth Summit") in 1992, says in its Article 8(j) – Each Contracting Party shall (as far as possible and as appropriate), subject to its national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such

knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices.

11.2. The Biological Diversity Act, 2002

Since India is rich in biological diversity and associated traditional knowledge, and it is a party to the Convention on Biological Diversity (CBD) 1992, the Biological Diversity Act, 2002 was enacted. Section 36(5) of the Biological Diversity Act says: The Central Government shall endeavour to respect and protect the knowledge of local people relating to biological diversity, as recommended by the National Biodiversity Authority through such measures, which may include registration of such knowledge at the local, State or national levels, and other measures for protection, including *sui generis* system.

For the purposes of this section: “*ex situ conservation*” means the conservation of components of biological diversity outside their natural habitats; “*in situ conservation*” means the conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties.

The Biological Diversity Act (2002) mandates implementation of the provisions of the Act through decentralized system. The State governments are now in the process of implementing the Biological Diversity Act through framing of biodiversity rules. For instance, the Government of Andhra Pradesh has made the rules in 2009 called, “Andhra Pradesh Biological Diversity Rules”, 2009. The governments are also seeking to involve indigenous/tribal communities more actively, and to apply their knowledge in the conservation and sustainable use of forest resources.

11.3. The Draft National Tribal Policy, 2006

The draft National Tribal Policy prepared in 2006 says, dwelling amidst hills, forests, tribals over the centuries have gained precious and vast experience in combating environmental hardships and leading sustainable livelihoods. Their wisdom is reflected in the utilization of forest species like herbs and plants for medicinal purposes, meteorological assessment etc. This invaluable knowledge needs to be properly documented and preserved to prevent it getting lost as a result of “modernization” and the passage of time.

12. Intellectual Property Rights for Indigenous Knowledge

There are considerations on the intellectual property rights (IPR) for protection of the indigenous knowledge of tribes. It is an important area for deliberation and it involves many issues. For instance, the tribal knowledge is often held collectively rather than individually, it is orally transmitted without any documentation. These are considered to be incompatible to the existing IPR rules. However, it is not impossible to draw suitable solutions. A better example in that direction is the popular case of Kani tribe in Kerala. The Kani tribe’s use of a plant locally known as “*arogyapacha*” (*Trichopus zeylanicus* ssp. *travancoricus*) and associated knowledge and the “Jeevani”, an herbal product derived from that plant, address the issues of intellectual property rights, use of biological resources

and associated traditional knowledge, and sharing of the benefits arising from the use of such resources and knowledge.

Kani Tribe's *arogyapacha* and Jeevani

The Kani tribe use/depend on *arogyapacha* (*Trichopus zeylanicus* ssp. *travancoricus*) for its berries. The plant (particularly the fruit and leaf) has unusual health and medicinal benefits. It relieves fatigue, boosts stamina, helps control tumours, activates the body's natural defences and cellular immune system, and has anti-stress and immune-stimulating properties. Their knowledge of this plant for its revitalizing effects helps them traverse difficult terrain to find food and access forest resources and plays a pivotal role in their survival. This plant came to the notice of a team of scientists led by Dr. Palpu Pushpangadan of Jawaharlal Nehru Tropical Botanic Garden and Research Institute (JNTBGRI), Palode, Thiruvananthapuram, Kerala, during their ethnobotanical expedition to the Western Ghats. They noticed that their guides from Kani tribe were not tired in contrast to themselves. They realised the significant potential of this plant for its medicinal value and for market, it is proved to be safe. Subsequently, an herbal product of Jeevani (means "giver of life") was derived from the *arogyapacha* plant and knowledge of Kani tribals by the JNTBGRI and manufactured by the Arya Vaidya Pharmacy Limited (AVP), Coimbatore. The benefits arising from the indigenous/tribal knowledge based drug Jeevani is being shared among the stakeholders.

13. Documentation of Indigenous Knowledge

As discussed earlier, tribes have vast knowledge of forest resources. Such knowledge is on the way to extinction because of many factors such as: modernization, development programs, depletion of forest resources, undervaluation and negligence, and passage of time. And there is absence of documentation. In view of the above, and as also mentioned in the draft National Tribal Policy, the invaluable knowledge of tribes needs to be properly documented and preserved to prevent it getting lost. Documentation is also required in the context of intellectual property rights. Of course, there are conflicting views on documentation of indigenous knowledge. It is argued, on the one hand, that document of such knowledge may cause to its misappropriation, on the other hand, that it helps to prevent its misappropriation through the erroneous granting of patents as happened to turmeric and neem of India, which led to the establishment of Traditional Knowledge Digital Library (TKDL).

However, mere documentation is not the only and ultimate solution, as such knowledge needs to be managed properly through preservation, conservation, promotion, etc. for posterity. The Provisions of the Panchayats (Extension to the Scheduled Areas) Act, 1996 (PESA Act 1996) [Section 4 (d)] also provides that "every Gram Sabha shall be competent to safeguard and preserve the traditions and customs of the people, their cultural identity, community resources...." Under the Biological Diversity Act 2002 and rules 2004, a facility is provided to document indigenous/traditional knowledge in the Peoples Biodiversity Register which can stand the scrutiny of law as an evidence to claim benefits whenever IK/TK is commercialised by companies.

14. Summary

Indigenous knowledge is considered to be relevant for various stakeholders and in many ways. Such knowledge of tribes, particularly on forest resources and products, is vast and diverse in India. Many tribes live in different forest zones and differ widely in their lifeways and knowledge. Because the forest is not just a vital natural resource and habitat for wildlife, it sustains rich biological diversity. Forests and forest resources are also highly variable in India. Since the knowledge is associated with resources, the forest-dwelling tribal people are endowed with vast knowledge on the forest resources and products. The knowledge among tribes is not only wide and diverse, but each tribal community has rich and deep knowledge of the forest, based on the relevance to them in their specific cultural and local environmental contexts. This unit also discusses the existing policies on indigenous knowledge, role of intellectual property in the protection of such knowledge, and the need of documentation of knowledge.

15. Recapitulation

- What do you mean by indigenous knowledge?
- Do you think that indigenous knowledge is relevant for tribals today?
- What are the diverse ways of living and knowing?
- Do you think that the forest resources and the associated knowledge is highly diverse in tribal India?
- What are the dominant domains of forest resources and knowledge among the tribal communities in general and Konda Reddis in particular?
- What are the minor forest products available in your area?
- What are the policies (international and national) on indigenous knowledge?
- How and why the intellectual property rights are important for protection of indigenous knowledge?
- What is the need of documentation of indigenous knowledge in Peoples Biodiversity Registers?

16. Key Terms

Indigenous knowledge, traditional knowledge, local knowledge, diverse cultures, diversity of knowledge, forest resources, forest products, biological diversity, biodiversity policies, intellectual property, documentation, Peoples Biodiversity Register.

17. Activity

- Many tribal people meet their basic needs from the forest resources/products based on their indigenous/traditional knowledge. However, certain forest resources and associated tribal knowledge are about to die. Identify few domains/categories of such knowledge based on your experience or interaction with the tribes.

- Explore the best practices of indigenous knowledge among the tribals in your area.
- Indigenous knowledge of tribes teaches us a lesson on their survival and sustenance. Learn how?
- What steps can you take to prevent the erosion of indigenous knowledge and promote the sustainable livelihoods for tribes in your area?

18. References

- CBD. 1992. *Convention on Biological Diversity*. <https://www.cbd.int/convention/text/>
- Kodirekkala, Koteswara Rao. 2018. Cultural adaptation to climate change among indigenous people of South India. *Climatic Change* 147 (1–2): 299–312. <https://link.springer.com/content/pdf/10.1007%2Fs10584-017-2116-8.pdf>
- Kodirekkala, Koteswara Rao. 2015. External Intervention, Local Environment, and Knowledge Erosion: A Forest-based Community of South India. *Culture, Agriculture, Food and Environment*, 37(2): 124–129. <http://onlinelibrary.wiley.com/doi/10.1111/cuag.12059/full>
- Koteswara Rao, K. 2008–10. Variation in Ethnobotanical Knowledge and Cultural Significance of Plants. *Humankind*, 4–6: 137–143.
- Koteswara Rao, K. 2011. *Dynamics of Indigenous Knowledge among the Konda Reddi of Rampa Agency in Andhra Pradesh*. Unpublished Ph.D. thesis submitted to the University of Hyderabad, Hyderabad.
- Koteswara Rao, K. 2013. Conservation of Biological Diversity (Unit 2 in Block 6) in *Environmental Anthropology* (a course/textbook for Masters in Anthropology Programme), pp. 25–40. Indira Gandhi National Open University (IGNOU), New Delhi.
- Sakti. 2013. *Nallamalalo Chenchu Prapancham* (Trans.: Chenchu world in Nallamala forest). Hyderabad: Sakti & Navodaya Bookhouse.
- Turnbull, Colin M. 1962. *The Forest People*. New York: Simon and Schuster.
- WIPO (World Intellectual Property Organization). 2010. Using Traditional Knowledge to Revive the Body and a Community. <http://www.wipo.int/ipadvantage/en/details.jsp?id=2599>.

4

Forest Policy and Forest Laws

"The Government of India has assigned the ownership of minor forest produce to the people living in and around forests ...through a national level legislation named as the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006. This will help the forest-dependent people to improve their economy" (Sinha n.d)

The review of the National Forest Policy by Indian Institute of Forest Management (IIFM 2001) has suggested to resolve, protect and improve the environment and forests of the country by initiating key programs including forest protection and afforestation, JFM, forest fire control measures, treatment of drought prone areas, strengthening of infrastructure, wildlife conservation, pollution control measures and implementation of environment law. But much of these activities are not justified or well integrated within the forest policy cycle (Joshi et al 2010).

Source:

Sinha, D.K. n.d. The National Forest Policy of India.

<http://www.yourarticlelibrary.com/geography/the-national-forest-policy-of-india/42250> accessed on 7.4.2018.

Joshi, Aditya Kumar, Pallavi Pant, Prasant Kumar, Amarnath Giriraj and Pawan Kumar Joshi. 2010. National Forest Policy in India: Critique. Small-scale Forestry DOI 10.1007/s11842-010-9133-z accessed on 7.4.2018

- *Why is that the above two statements contradict each other?*
- *To which statement you would subscribe?*

Contents

1. Introduction
2. Learning Objectives
3. Forests and Tribes
4. Forest Policy and Legislative Framework in India
5. Forest Policies in Colonial India
6. Post-Colonial Forest Policies
7. Forest Rights Act, 2006
8. Summary
9. Recapitulation
10. Key Terms
11. Activity
12. References

1. Introduction

Since times immemorial the tribal people have enjoyed freedom to use the forest and its resources in their habitat. And this has given them a conviction, which remains even today deep in their hearts, that the forests belong to them. The freedom to use forest continued happily until pre-British period. Thereafter, people from outside began to move into the forests. Then the conditions of forests and tribal people began to change. The gradual extension of the authority of the government in these areas and the natural desire of the forest officials to exercise closer control over the use of forest products deeply disturbed the entire tribal economy, and sowed the seeds of conflict. This restricted the tribes from using forest resources (Munshi: 2012). The colonial and post-colonial forest policies and laws considered the tribes as destructors of the forests and wildlife. These laws regulated tribal rights over the forest produce and forest lands.

The concept of state ownership of forests came into conflict with the traditional rights and practices of tribes. In Andhra Pradesh laws governing forests have also contributed to large-scale land alienation in the scheduled areas. In several locations in the state of Andhra Pradesh, tribes lost access to their agricultural land and commons following the demarcation of forest boundaries. However, lately the government realized that tribes are not the destroyers of forest rather they have been conservators of forests and the forests can be better managed by the forest department with participation of tribes. Thus, evolved the participatory forest management in which both the officials and tribes work together and latter share some benefits in this endeavour. The participatory forest management network played a critical role in evolving the Joint Forest Management (JFM) strategies in the initial stages. It encouraged participation of local village communities in forest management through JFM, by organizing them into VSSs. Apart from creating awareness among the communities about JFM it lobbied for pro-peoples policies at the policy level. Specifically, the network was involved in resolving the problems or conflicts pertaining to demarcation of boundaries.

This unit discusses the various forest policies and forest laws since colonial period followed by the impact of forest policies on tribal livelihood and their socio-economic life. It also discusses the various Forest Acts, legislation, and issues related to forest policies in general.

2. Learning Objectives

By the end of this unit, you will be able to:

- 1) Understand the relation between forests and tribe;
- 2) Examine the Indian forest policies and laws during colonial and post-colonial period;
- 3) Explains the evolution of State control over forest resources;
- 4) Understand curtailment of the traditionally held rights of tribes progressively curtailed through the development of forest policies and laws;
- 5) Know about the forest policy and participatory forest management;
- 6) Understand the emergence of Forest Rights Act-2006 and its implementation process.

3. Forests and Tribes

According to Forest Survey of India in terms of spatial distribution, 60% of the total forest cover of the country is found in 187 districts categorized as tribal districts that cover 36.91% of geographical area. Similarly, 123 ecologically sensitive hill districts, some being tribal districts, account for 40.44% of total forest cover of India. Forests are highly significant for Indian society in general and tribal society in particular because more than 100 million is actually forest dwellers and another 275 million is dependent on them for their livelihood and means of survival (Pratap:2010). In India the majority of the tribes (93.8 million) live in rural areas which constitute 11.3 per cent of the rural population, while 10.5 million live in urban areas constituting only 2.8 per cent of the urban population of the country.

Andhra Pradesh contains extensive forested landscapes across its two main physiographic regions: the hilly northern Rayalaseema, and the fertile Coastal Andhra region. Around 65 per cent of Andhra Pradesh forest area is spread over eight tribal districts in the northern part of the state. In each area forests exist in both contiguous blocks, and also within domesticated mosaic landscapes adjacent to agriculture, pasture and other land uses. Andhra contains two main contiguous forest belts: one across the north of the state, and the other running in a north south belt in the Nallamalai hills. The forest area was gradually taken over by the Forest Department from the late 19th Century onwards. The forest department classified the forest as 'Reserved Forest' (RF), 'Protected Forest' (PF), and 'Unclassed Forest (UF), and most of the forest area declared as Reserved Forests in Scheduled V areas.

Andhra's forested landscapes are populated by a mix of tribal and other inhabitants, who may be called 'forest dwellers' reflecting their historical residence in forest areas, their cultural affinities and livelihood adaptations to the forest niche. Millions of Andhra's forest people live within 'forested landscapes', predominantly in following districts i.e., in East Godavari, Prakasham, Srikakulam, Visakhapatnam, and West Godavari districts. Most of the scheduled tribes in the Andhra Pradesh inhabit the Eastern Ghats tracts, the rest of the tribes are distributed sparsely in other districts. A distinction may be drawn between plains and hill tribes:

- Plains tribes are typically more integrated with non-tribal society. Groups include the Nakkala, Lambada, Yanadi and Yerukula.
- Hill tribes have traditionally mainly depended on shifting cultivation and forest produce collection, and have been classified by the government as Chenchu, Konda Reddi, Kammara, Jatapus, Koya, Khond, Porja, Savara and Gadaba groups.

Anthropologists highlight the issues of the tribal communities, amongst which forests livelihood issues remain most crucial. Forest peoples' livelihoods closely dependent on access to forest and other lands for a range of purposes, including cultivation, grazing, hunting and product collection. Forests are important both for providing food security and safety nets in periods of hardship. Historically, the tribes of India have adopted nature as their habitats. Their subsistence pattern, economic, social institutions, beliefs and practices have been closely linked with the environment. The relationship between tribes and forest has often been called symbiotic, i.e., the two depend on each other like the mother and the fetus. Their dependence is not unilateral; the tribes depend on the forest and the forest in its turn depends on them for its preservation and continuity.

The social, religious and economic systems of the tribes revolve around the forest. A set of religious myths and social customs were built around the forest to ensure that economically important trees were protected, human needs were met and the species that were more commonly available were equitably distributed.

Tribes developed their own cultural mechanism for using and managing forests. These communities have deep cultural, spiritual, and indigenous knowledge of livelihood links with the forests around them. Over the years tribes have been conserving and regulating the forest resources with the help of spiritual and cultural knowledge. For example, in states like Odisha, Andhra Pradesh, Uttarakhand, and Maharashtra, in concentrated tribal belts tens of thousands hectares of forest area is protected by village communities, because forest is treated as common property. It was the utmost responsibility of tribal community to protect and preserve the forest, besides its cautious use. The mechanism of forest use was managed based on customary practices. Traditionally, they use forest resources that are essential for their survival but never exploit them. Therefore, excess and over-exploitation of forest resources was not practiced in any form. It was in the colonial period that natural resources were controlled by imposing forest policy and legislations.

In the next section we will discuss the forest policies and laws in colonial and post-colonial India and analyze how through the development of forestry policy, management and legislation, the rights of the tribal communities were ignored with imposition of stringent forest laws.

4. Forest Policy and Legislative Framework in India

Up to the Mughal period, systems of community property resources were largely intact. Accordingly, forest land was controlled and managed at the village level. The colonial forest administration was revenue-centric and exploitative, and thus recognized no rights and concessions for forest dwellers, especially tribes. Several regulations were passed in mid-nineteenth century with the object of protecting and regenerating forests for ecological reasons, as well as of facilitating production of timber on a sustainable basis, for both revenue and imperial purposes.

Forest policy and management has been a subject of considerable debate and conflict ever since the British established a Forest Department and enacted legislations related to forestry in the 19th century. The imperial needs dictated the British interests in the Indian forest resources, which resulted in the establishment of control over forest resources. In the process, at least two crucial aspects of forest management were ignored: the well-established traditional systems of conservation and sustainable use, and the critical ecological and social role that forests played.

5. Forest Policies in Colonial India

Before the intervention of British in India, the tribes and forest dwellers enjoyed free use of the forests and wastes in their habitat. Various princely states generally encouraged extension of agriculture in the forest area on the one hand and protected some forest area as their hunting grounds on the other. The tribal communities enjoyed relative isolation and autonomy with least interference of non-tribes. In some cases symbiotic relationships were noticed among the tribal and other communities. In few cases only that we find the

tribal society evolved into the chieftains and feudal lords or rulers that controlled land and people.

The forest policy in modern India started during the British period when the British learned the commercial value of Indian forest resources. The traditional framework of forest use was over-ridden in the second half of the nineteenth century, when the British realized the commercial value of India's forests resources. Later they gained control over the forest resources in the name of "scientific forest management". In modern India the enactment of forest laws was initiated by the East India Company and subsequently formalized by the British Government.

Historically, modern forest policy in India began in 1855, when the first Governor General Lord Dalhousie issued a memorandum entitled Charter of Indian Forest. Under the 1855 policy, the British government restricted the rights of the forest dwellers over forest resources. In order to implement the 1855 policy, the British government set up an administrative system, i.e., the Forest Department (Kashyap: 1985). However, for the first time, a systematic management of forest began with the appointment of a trained German forester Dietrich Brandis as the first Inspector General of Forest in 1864.

The objective of the management of forests was to restrict the supplies of timbers for various purposes and protect and treat it as a growing biological entity. Also the Government abandoned the rights of the individuals on forest resources and all government forests were made inalienable. In this regard the newly created Forest Department was tasked with the following: exploration of resources, demarcation of reserves, protection of forests from the fire, controlling shifting cultivation and assessment of growing stock in valuable reserves by sample enumerations and prescription of yields which could be sustained. The objective of the Government of India was to treat forest as a state's property and restrict the rights of forest dwellers over the forest resources.

The Government Forest Act 1865: This Act empowered the government and forest officials to declare any land which was covered with trees or brushwood as forest by its notification. The provisions under the Act was to protect forest trees, prevent forest fires, restrict cultivation and grazing in forest areas and punish if anyone breaches the provisions of the Act.

The forests, considered common-property resources prior to British, came under the authority of the government under the Act. In this period forest resources were used for the creation of infrastructure such as railways. Great chunks of forests were destroyed and a large number of trees were felled whose logs could not be utilized specially in the areas of sub-Himalayan forests of Garhwal and Kumaon.

The Indian Forest Act, 1878: Was more comprehensive than the earlier Act. Under this Act, forests were classified into three categories: Reserved, Protected and Village Forests. Through this Act the British Government further empowered itself and restricted the tribes and forest dwellers to move inside the forest. Under this Act, the government limited private property only to cultivated land. Activities such as grazing, product collection and temporary farming were excluded from category of privately owned, even if the owner paid taxes. The Act, while emphasizing commercial forest management, empowered the forest officials with greater power to scrutinize forest use. Under this Act, all the land that did not fall under 'continuous cultivation' or 'permanent settlement' was classified as forest land with the State being recognized as the sole proprietor.

In Andhra Pradesh the forest area under consideration happened to be in two administrative domains prior to the formation of the state in 1956. While the forests of the north-eastern districts of present Andhra were administered by a separate line of administration instituted by the British-administered Madras Presidency, the forests in the northern districts of Telangana were under the Nizam's administration. The forests of Kurnool – the Nallamala Range inhabited by the Chenchus had a troubled history of being under individual rulers, followed by the Nizam. Until the formation of Andhra Pradesh in 1956, the tribal areas of these regions were governed by two distinct administrative systems. The Madras Presidency had taken a more considerate line in respect of local people's forest rights from the IFA, manifested in the Madras Forest Act of 1882. There were two enactments in force, namely, AP (Andhra Area) Forest Act 1882 (or Madras Forest Act 1882) and AP (Telangana area) Forest Act 1915 (or Hyderabad Forest Act, 1915). In order to administer the state forest, the government established forest departments and by 1890 almost every province in India had a permanent forest administration.

BOX 1: In the late 18th century when forest covered large tracts, no need was felt for legal regulation of forest as these were abundant enough to satisfy the subsistence need of the people. Given the small population and abundant forests, there were only customary rights over the forest and its produce. Certain trees and forest patches were considered sacred and protected.

The Forest Policy, 1894: The first major forest policy in India during British period. The policy stated that the administration of state forests was for public benefit. This policy treated revenue generation from forest as secondary because since 1854 forests had been exploited for commercialization.

The policy stated that the Government could impose restrictions on the rights of the tribes and forest dwellers – inhabitants staying in or in the immediate neighbourhood of the forests because the state was the sole administering authority over forest. The landowning classes were politically strong and they had the power to resist any increase in taxes. As the tribes and the rural landless did not have any bargaining power, the 1894 policy deprived them of their source of livelihood.

The restriction of rights by the Government had negative impact on the forest dwellers. Due to this restriction, forest dwellers suffered from malnutrition, impoverishment and indebtedness. Further, it led to the overexploitation of forests which remained accessible to them after the Government closed all other forests. Only after such destruction of forest, the 1894 Forest Policy was changed, the British Government realized that forests were needed for the survival of forest dweller because no other sources were available for their income.

In the early 20th century the scientific forestry had begun. To conserve forest, the British Government applied two methods: regenerating forests and silvicultural systems in different forests. Thus, silviculture research was organized and the Forest Research Institute was established at Dehra Dun in 1906.

The Indian Forest Act, 1927: This Act gave extensive powers to state governments to formulate and implement forest laws. The forests so constituted were subject to strict regulations. The main objective was to increase the revenue for the government. In this

Act, the Government, instead of conserving the forest for the interest of people, allowed the export of valuable timbers for remunerative purpose. Tea, coffee, rubber and pine plantations were raised by cutting down large natural forests in many hilly and mountainous regions of the country in order to serve the interest of the Empire.

Section 28 of this Act had the provision to constitute 'Village Forests' and authorized state governments to assign to any village-community, the rights of government over any land constituted as Reserved forest. The section also provided that the state government may make rules for management of village forest and prescribe duties of the village community for protection and improvement of such forests. Thus, the provision of 'Village Forest' provided some scope for involving village communities in forest management, but in practice, no major steps were taken to actualize that.

In the Act it was specifically mentioned that the practice of shifting cultivation was deemed to be a privilege subject to control, restriction and abolition by the state government. The Act made provisions for arrest without warrant, for offences like disobeying the prohibition of quarrying of stones, burning of lime or charcoal, collection for any manufacturing process, removal of any forest produce and clearing of forest for cultivation, for building and for herding cattle.

Shifting cultivation was one major, traditional subsistence activity that got banned from the reserved forests. The restriction of shifting cultivation to small and demarcated areas forced the tribes to shorten fallow cycle or to prolong cultivation on designated patch until deterioration set in. Fernandez, et.al (1985) observed the shortening of fallow cycle in Orissa, in the last thirty years: In the 1940s, it was 18-25 years. In the early 1950s, it was a 15-18 years cycle and now in most areas six years (in some areas, three years).

Likewise the population of shifting cultivators in one *taluk* of Nasik declined by 24 per cent in a single year-1874 and migrated to neighbouring princely states due to the restriction of shifting cultivation. The Koya tribe of Bhadrachalam, who were accustomed to shifting cultivation, were forced to follow a type of fallow cultivation as a result of the felling of trees in the forests of the area starting in the last quarter of the 19th century. With the result that some tribes lost their lands to the moneylenders and became tenants, and sold their land and became either annual farm servants or casual labour.

The Government of India Act, 1935: Brought forests in the provincial legislative list. Commercial exploitation of forests was encouraged at the cost of the tribes in the name of national interest. The tribes were the real victims of commercial exploitation of forests because their various customary rights over forests were curtailed and contractors collected most forest resources.

Under the colonial forest policy, shifting cultivation was discouraged without any appropriate alternative scheme. Tribes lost the source of livelihood.

- In Jharkhand due to loss of source of livelihood, many tribes migrated to town and city and worked as cheap labour in farming, mines, factories and road contractors (Sengupata: 1988).
- In north coastal districts of AP, in particular, tribes have lost large chunks of land that they had used for *podu* (shifting cultivation).
- In Hyderabad, with the ban on forest resources, hunter-gatherer Chenchus were forced into a relation of serfdom with the more powerful cultivating caste.

- In Nallamala forests, the Chenchu tribals slowly lost their occupation due to the dwindling grazing grounds, due to the restrictions on grazing land.
- In Chotanagpur, restrictions on hunting led to precipitous fall in the population of Birhor tribe.
- There have been several tribal revolts against these processes of tribal ancestral lands being appropriated by the FD in many parts of the country, for example in Andhra region the Rampa rebellion in Godavari district (1922-24) and in Telangana the Gond Revolt in Adilabad (1940).

6. Post-Colonial Forest Policies

Soon after independence, the Government of India declared a new forest policy called National Forest Policy, 1952. Subsequent to that is the taking over of most of the uncultivated lands/forests under Zamindars and Princely rulers. This policy 1952 was formulated on the basis of the following paramount needs including: land for grazing, small wood and firewood, timber and other forest produce for defense, communication and industry, and revenue. Unlike in 1894 forest policy, in this policy the forests were further classified functionally. The functional classifications were: protected forests, national forests, village forests, and tree lands.

Among these classification village forests were to be maintained primarily for providing firewood, small timber, grazing areas for village communities in the neighborhood of a forest. In 1952 forest policy, the emphasis was given to national interest over the use of forest by village communities in its neighbourhood. The policy pointed out that local interest and priorities should be subservient to national interest. Thus, village communities in the neighborhood of a forest will naturally make a greater use of its products for the satisfaction of their domestic and agricultural needs. Such use, however, should not be permitted at the cost of national interests.

However, in the name of national interests, the Government of India used forest resources to meet the requirements of defence, communications and vital wood-based industries. Though the policy was formulated to meet the needs of tribal and other forest neighborhood communities, the national interest of the policy denied the community an opportunity to fulfill its needs. In this policy the role of the forest community was to protect and create forests, not to manage it.

Box 2: National Forest Policy 1952

In this policy forest were considered to be held in reserve to be used for the purpose that government considered important, particularly for industrial raw material and urban timber requirement. This deteriorated the relationship between forest and people. Anthropologist Verrier Elwin in his work *A Philosophy for NEFA* discussed the 'melancholy' effect forest reservation had on the tribes of Middle India, for whom nothing aroused more resentment against the government than the taking away of the forests they regarded as 'their own property'. The forest policy of 1952 continued the process of expanding state control over forests while further curtailing community rights and authority. Thus the policy affected stricter control on forests resources of India as compared to the earlier policy (Pratap: 2010).

Though an emphasis was given on ecological and social forestry, in actual practices the government went against it. In most parts of the country large section of ecologically sensitive areas were destroyed to make way for big projects such as power, mining, irrigation and industrial ventures and infrastructure like roads and railways. Through the contract lumbering system, huge areas of forest have been clear-felled to raise revenue for the State.

Since the enunciation of the National Forest Policy in 1952, developments of far reaching importance had taken place in the economic, social and political fields. In the newly formed state of Andhra Pradesh, regulation of land in the Scheduled Areas was made uniform across the state through the Andhra Pradesh Scheduled Areas Land Transfer Regulation (APSA LTR) in 1959.

In Andhra Pradesh the AP Forest Act, 1967 was thus drafted and passed by the legislature and it is in force from April 1967. Various acts and rules were later introduced to complement and strengthen the existing forest policies. Under the A P Forest Act of 1967, forest offences rules (1969) were introduced describing in detail how forest officers can carry out the compounding prosecution when they combat the offence and the procedure for booking and fixation of penalty to the offender. Similarly, the AP Forest Produce Transit Rules, 1970, were introduced to halt illegal movement of forest produce from or within the state. To ensure revenue to the government, creating a state monopoly in trading and dealing with the forest produce in the state introduced the following regulation:

- 1) The AP Minor Forest Produce (MFP) (Regulation of Trade) Act, 1971,
- (2) The AP Scheduled Areas MFP (Regulation of Trade) Regulations, 1979,
- (3) The AP Scheduled Areas MFP (Regulation of trade) Rules, 1990,

The Central Board of Forestry (CBF) recommended the establishment of a National Commission on Agriculture (NCA) to study the National Policy and give recommendation for a revised National Forest Policy. Following the recommendation of CBF, the Government of India constituted the NCA in 1970 to examine all aspects of agriculture including forestry (Fernandes et al 1988). The Commission on Agriculture in 1976 recommended giving priority to industrial needs of forest products. It pointed out that production of industrial wood was the primary purpose of forest and reduced the importance of the community. As consequence, the Commission published its report in 1976.

However, the Commission has not paid a positive attention to the interest of the forest dwellers. In its report, the NCA assumed that the deterioration of forests was due to forest dwellers. Thus, NCA suggested the restriction to forest dwellers in regulation of *nishtar* rights, i.e., rights of the forest dwellers over some Minor Forest Produces (MFP). In this regards, the NCA stated that it is desirable that *nishtar* should be regularized in such a manner that the deserving people get their essential requirements conveniently and at reasonable rates, and productivity of forests is maintained.

Meanwhile, the regulatory mechanism of forest administration continued to be governed by the Forest Act, 1927. The provision of environmental protection and improvement were explicitly incorporated into the Constitution by the 42nd Constitution (Amendment) Act, 1976. The 1976 Act transferred forests from the State List to the

Concurrent List of the Constitution. The Act implies that both, central and state governments are empowered and share the responsibility to protect and control India's forests.

In the Fifth Five-Year Plan, the Social Forestry schemes have been taken up under the all-India policy recommended by the NCA. The Social Forestry programme was initiated primarily to manage and protect forest and afforestation in barren land for aiding in environmental, social and rural development. The Social Forestry programme was widely designed to meet the primary needs of the tribal and rural population and was opposed to the industrial and revenue purpose. The objectives of the Social Forestry were: a mixed production system including fruit, fodder, grass, fuel wood, fibre, small timber; involvement of the beneficiaries right from the planning stage; minimal government control; financial contribution by local bodies, voluntary contribution, government subsidies; and use of communal and government lands (Mahapatra: 1994).

Despite the empowerment of state and central government under the 42nd Constitution (Amendment) Act, 1976, deforestation continued at alarming rate. The high rate of deforestation and the diversion of forest land that was taking place for industrial and agricultural activities lead to the enactment of the Forest (Conservation) Act 1980 (FCA). Under the Act 1980 the State governments were given the privilege to declare any forest as "Reserve Forest". In Andhra Pradesh forests recognized under section 15 of the AP Forest Act, 1967 are Reserve Forests.

The FCA was enacted with the objective of conserving India's forests. The Act made it compulsory for state governments and other authorities to obtain central government permission for diversion of forest land for non-forest purposes as well as de-reservation of forest lands. It has been estimated that between 1920 and 1990, the forest cover in Western Ghats decreased by as much as 40%. Forests are being diverted for various development projects like mining, hydel power projects, roads, and large industrial projects. The FCA (1980) Act reduced the diversion of forest land but also caused resentment among the forest people affected by the delay in development projects due to the cumbersome process of getting central government clearance. Legislation such as the following was enacted to bring a positive influence on the forest resources of the country: The Wild Life (Protection) Act, 1972, The FCA Act, 1980, and The Environment (Protection) Act, 1986.

However, the absence of community related safeguards, consultations and appropriate communication, created problems and apprehensions among various tribal and local communities. Up to late 1980s the forest policies in India were guided by a commercial production view ignoring the conservation-protectionist view. As a result, the Central Board of Forestry convened a meeting of forest ministers from all states on the 7th August, 1982 to discuss the criticisms of earlier forest policies and the draft of Indian Forest Bill, 1980. The discussion was ended with formulation of a new draft forest policy. The Board also suggested giving more importance to afforestation rather than to revenue generation.

Moreover, the new forest policy demanded an involvement of the people in its formulation and implementation. In this new approach, a Committee was constituted under the Chairmanship of Prof. B. K. Roy-Burman, an eminent anthropologist, on Forests and Tribes in India. The committee emphasized in its Report that on the "symbiotic relationship" between the forests and the forest dwellers and made the following suggestions.

50 • Natural Resource Management and Biodiversity

- Full participation of the local inhabitants in the reforestation and afforestation programmes.
- Development of the forest dwelling communities along with developmental activities at forest areas.
- Integration of rural development, afforestation and industrial development in a way that will not marginalize the local community.

Later, on December 7th a new Forest Policy 1988 came into force. This is the first “environmental” policy document in India that explicitly recognized the linkages between environmental and social concerns in terms of community rights to natural resources. The basic objectives of the National Forest Policy (NFP), 1988 stated:

The principal aim of forest policy must be to ensure environmental stability and maintenance of ecological balance including atmospheric equilibrium which are vital for sustenance of all life forms, human, animal and plant.

The direct economic benefits were subordinate to the primary ecological objective. Unlike the previous forest acts that privileged revenue and commercial interests, the NFP was strikingly different. Section 4.6 of the policy highlighted the symbiotic relationship between tribals and forests and the need to involve tribal communities in the management of forests. This policy also involved agencies like forest department, Girijan Cooperative Corporation, and community based organizations that should be associated with the tribal people in the forest management. Some of the objectives that should govern the National Forest Policy are the following:

- Meeting the requirements of fuel wood, fodder, minor forest produce and small timber of the rural and tribal population.
- Creating a massive people’s movement with the involvement of women in the development and protection of forests.
- Protecting and improving Non-Timber Forest Products (Minor Forest Produce) which sustain tribal population and other communities residing in and around the forest.

The policy for the first time emphasized involving people to achieve the above objectives. Further, in January 1989, the Government of India directed all states governments to work out the modalities to ensure the active participation of village communities living close to forests in the afforestation programme. Moreover, the policy mentioned that committed NGOs with proven track record might be particularly helpful in organizing village communities for the protection, afforestation and development of degraded forest lands. Compared to previous two forest policies, the National Forest Policy 1988 has been viewed as radically different as it declared that forests are not to be commercially exploited for industries but they are to conserve soil and environment and meet subsistence requirement of forest communities.

After a long history of forest policy, the policy planners and forest administrators began to develop new strategies to reduce the conflict between the state agencies and forest people. An attempt was made to facilitate the emergence of collaborative forest management systems that responded to national needs and local resources requirements. The concept of Joint Forest Management (JFM) evolved in this Act in the process of conflict

and compromise between the government and forest communities. The Ministry of Environment and Forest (MoEF), Government of India, in the 1990 outlined the JFM framework for involving village communities and voluntary agencies for the protection, regeneration of degraded forest lands and the development of forest lands situated in the vicinity of the villages.

The concept of JFM also signaled shift from 'command and control' approach to a 'network' approach in forest governance in India. The initiative of government for people's participation in forest management is widely accepted in the country. With this national resolution, 22 states had approved the guidelines of JFM. The Government of Andhra Pradesh passed the JFM order on August 28, 1992, which was amended in 1996.

In consonance with the National Policy, the Government of AP framed a revised State Forest Policy in 1993. Under this, Vana Samarakshana Samithis (VSS) were established to protect the forest resources, mainly in the hill areas. Community Forest Management (CFM) introduced in 2000. The legal backing for CFM has come through a package of supporting changes: the relaxation under Forest Conservation Act (FCA) for medicinal plants cultivation by VSS, the liberalization of the state monopoly of NTFP, conformity of Panchayat laws with CFM regulations.

The primary objective of JFM was to ensure sustainable use of the nation's forest to meet local needs equitably while achieving India's broader environmental goals. In the state level, most state forest departments have now been authorized to establish formal dialogues with communities and devolve some management responsibilities to them which is central to their survival.

However, many conflicts have existed between villager's expectations and needs and state guidelines for forest management and product sharing. At the official level, the forest department is reluctant to grant greater rights to forest protection groups because they have been controlling forest for more than a century. Thus, the government's control over forest contradicts in the community management system of forest at the village level. In this regard, the community management groups have responded differently in region to region. Reacting on this JFM programme:

- Some groups contend that the forest department's recognition of independent community forest management activities may be used to co-opt and bring them under government control.
- In some areas villagers are extremely wary of the forest department's involvement and have banned their entry into villages.
- In other regions, village communities are anxious that the forest department staff register their groups and demarcate their protected forests.

Despite JFM representing a positive step towards decentralization forest management, with the potential of empowering and increasing livelihood security for impoverished forest dependent women and men, it remains a fragile institution in relation to the 1988 policy mandate. While this policy has more people-oriented provisions, it still has the concept of exclusive state ownership of forest and mention industrial needs as national needs (Choudari: 2007). One may find that a major difference in the post-1947 situation has been the rapid expansion of forest-based industry. The demands of the commercial

industrial sector have replaced strategic imperial needs as the cornerstone of forest policy and management (Gadgil and Guha: 1992).

Over the years the 73rd constitutional amendment incorporated in 1992, while recommending decentralization to three-tier Panchayati Raj Institutions (PRIs) (District, Block and Village) has included social forestry, fuel wood plantation and non-timber forest products to be brought under their purview. Thus emerged confusion and conflicts between forestry institutions and PRIs. This overlapping of mandates of Village Panchayat and Van Suraksha Samiti (Forest Protection Committee) is a problematic issue in local governance of forests and Panchayat may threaten their effectiveness.

A movement by social and human right activists was started which considered rights of the tribals over local resources as sacrosanct and non-negotiable. They initiated a move to secure Constitutional recognition for these rights. These movements, along with Bhuria Committee's recommendation, forced government to amend in Vth Schedule and known as the Panchayats Extension to Schedule Areas (PESA), 1996. It decentralized existing approaches to forest governance by bringing the *Gram Sabha* at centre stage and recognized the traditional rights of tribals over "community resources"—meaning land, water, and forests. Despite the enactment of PESA the large body of research carried out by scholars on the extent of displacement and impoverishment of tribal people caused by compulsory acquisition of land by the State, calls into serious question the commitment or ability of the Indian State to upholding Constitutional safeguards for the protection of land and resources and welfare of tribal communities. Another example of this ideological bias is the Biodiversity Act, 2002, which is much more friendly to industry than it is to local communities [Kalpravriksh undated (b)].

7. Forest Rights Act, 2006

In the year 2005 when the National Advisory Council recommended that a law should be framed for forest rights. Subsequently, the Scheduled Tribes (Recognition of Forest Rights) Bill, 2005, was proposed in parliament in December 2005 and after a lot of deliberations and a Joint Parliamentary Committee going into various aspects of the Bill, an Act by the name of 'The Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act 2006', commonly referred as Forest Rights Act (FRA) was enacted on 29 December 2006. This historic Act came into force on 31 December 2007.

The Forest Rights Act, 2006 is a landmark law in the evolution of the government's attitude towards the forest-tribal relationship. The emergence of FRA, 2006 seeks to 'undo the historical injustices' suffered by tribal communities throughout colonial and post-colonial period. The Act recognizes individual and community rights over forest land of people who could prove that they had lived on or had been cultivating the land prior to December 2005. The Act also recognizes their rights to use, manage, and protect forest resources.

The Forest Rights Act, 2006 is being implemented all over the country after the Act Rules (2008) were notified in January 2008. The 'historical injustices' committed through the successive Indian Forest Acts, and the Madras Forest Act, 1882 were redressed through this Act. Various steps are being taken by the nodal agency, Tribal Welfare Department, to implement the Act. The status of individual and community rights claims under the FRA (as of 31 January 2014), according to data with the MoTA, is as follows:

**Table 1: FRA claims status as of 31 January 2014
(ind=individual; com=community)**

State	No. of Claims Received	No. of Titles Distributed	No. of Claims Rejected	Total No of Claims Disposed
Andhra Pradesh	4,11,012 (4,00,053 ind; 10,959 com)	1,69,370 (1,67,263 ind; 2,107 com)	1,65,466	3, 34,836

Source: www.tribal.gov.in

FRA 2006 promises to be a pro-poor institutional reform and many poor have already benefited from its implementation. However, the process has been severely anti-poor. If you see the above figures, there is huge gap between the land claimed and the actual extent of the titles issued to the claimant, and so the pro-poor benefits have been restricted in many ways.

8. Summary

In the past, tribes did not have any restrictions on entering forest areas and the entire economic activities and livelihood of the tribes were fully dependent on the forests. The freedom to use forest continued happily until pre-British period. The relationship between tribes and forest has often been called symbiotic, i.e., the two depend on each other like the mother and the fetus.

The colonial government passed the Indian Forest Act, 1865 for acquisition of forestlands for creation of infrastructure such as railways, industries etc. Later, through the enactment of Indian Forest Act, 1878, the State got monopoly control over forest lands for commercialization purpose. Subsequently, the Indian Forest Act, 1927 was enacted, which was carried over after independence and formed the basis of all forest laws in India. Forests were categorized into three types: Reserved Forests; Protected Forests and Village Forests. The colonial forest administration was revenue-centric and exploitative; it recognized no rights and concessions for forest dwellers, especially tribes. Several regulations were passed in mid-nineteenth century to protect and regenerate forests for ecological reasons, as well as of facilitating production of timber on a sustainable basis, for both revenue and imperial purposes.

Prior to the government of India announcing its Forest Policy in 1952, one of the prime concerns of the forest department was to increase revenue generation from forests. Later the following legislations were enacted: The Wild Life Protection Act, 1972; The Forest Conservation Act, 1980; The Tree Prevention Act and the Forest Policy, 1988. The colonial and post-colonial forest laws considered the tribes as destructor of the forests and wildlife. These laws always regulated tribes rights over the forest produce and forest lands.

The Government passed the Scheduled Tribes and Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006. The Act sought to redress injustices that tribal and forest dwelling communities had faced in relation to their access to forests and forest produce since colonial rule. The Forest Rights Act 2006 recognizes individual and

community rights over forest land of people who could prove that they had lived on or had been cultivating the land prior to December 2005. No doubt law has provided a dignified status to tribals but the implementation process of FRA has been poor, and so the pro-poor benefits have been restricted in many ways.

Officials working in tribal areas need to understand the tribal problems from the perspective of tribes. The relationship between tribes and forest has often been called symbiotic relationship because the social, religious and economic systems of the tribes revolve around the forest. But most of the officials misunderstand the relationship between tribes and forest and considered the tribes as destructor of the forests and wildlife. Tribes were living in forest and dependent on forest resources since ages. Traditional rights and livelihood patterns of the forest-dependent tribes need to be respected while designing and implementing forest management programmes. Officials should not evict people practicing shifting cultivation without creating real alternatives for them. In tribal areas to success of any programme requires the support of other departments working for the development of tribes and clearly a need to resolve the contradiction between working departments. Before drawing up any policies the importance of sensitivity to the tribal community and their internal dynamics need to understand properly.

9. Recapitulation

- What are the salient features of Indian Forest Act, 1865?
- What are the premises made for Forest Policy in 1952? What are the provisions made in the acts which were detrimental to the interests of tribals?
- How do you think the provisions contained in 'The Forest Rights Act 2006' addressed to the concerns of the tribals?

10. Key terms

Adivasi, Gram Sabhas, Patta land, Shifting cultivation, PESA, FRA, Minor Forest Produce

11. Activity

- Discuss the procedure of filing the claims in FRA.
- Find out from the tribals inhabiting the fringes of forest the problems that they encounter in accessing the forest resources.
- Find out from the tribals whether they are able to enjoy the provisions contained in the Forest act 2006 or not?

12. References

- Choudari, B. 2007. Forest and Tribals: A History Review of Forest Policy. In Chittarajan Kumar Paty, (ed.) *Forest Government and Tribe*. New Delhi: Concept publishing company.
- Fernandes, W, Geeta Menon & K.T.Chandy. 1988. *Forests, Environment and Forest Dweller Economy in Chattisgarh: A Report of a study on Deforestation, Marginalisation and Search for Alternative*. New Delhi: Indian Social Institute.

- Gadgil, M & Guha, R. 1992. *This Fissured Land: An Ecological History of India*. New Delhi: Oxford University Press.
- Mahapatra, L. K. 1994. Parameters of Forest Policy for Tribal Development. *Social Action*. Vol. 44, (4), October-December.
- Munshi, Indra. 2012. *The Adivasi Question: Issues of Land, Forest and Livelihood*. New Delhi: Orient Black Swan.
- Pratap, Dinesh. 2010. *Community Participation and Forest Policies in India: An Overview*. *Social Change*, 40 (3).

5

Involving Tribals in Forest Management

"While some studies suggest that community-based forest management improves community livelihoods and well-being, and can also provide economic benefits, these studies are largely incomparable because they measure different outcomes using different methodologies. There does, however, seem to be a pattern suggesting that community-based forest management can aggravate existing inequalities - both social and economic - within the communities" (Dasgupta 2017).

Source:

Dasgupta, Shreya. 2017. Does Community-Based Forest Management Work in the Tropics? The WIRE. Environment. 6 Nov. 2017. <https://thewire.in/environment/community-based-forest-management-work-tropics>. Accessed on 7.4.2018.

- *How do you react to the above statement?*
- *Which part of the above statement is true to the tribes of Andhra Pradesh?*

Contents

1. Introduction
2. Learning Objectives
3. Status of Forests and Dwindling Forest Wealth
4. Role of Government and NGOs in JFM and CFM
5. Issues of Benefit Sharing Mechanism, Its Accrued Benefits or Incremental Accruals /Benefits
6. Man Animal Conflict and Issues of Communities Living Within and in Peripheral Areas of Sanctuaries, National Forests and Biosphere Reserves
7. Issues of Climate Change and Mobilization of Efforts for Protection and Development of Tree Cover
8. Summary
9. Recapitulation
10. Key Terms
11. Activity
12. References

1. Introduction

Forests and tribals are like conjoined twins and are coexisting. Sustenance and development of forests and tribals is a two way function. The tribals depend on forests for their very existence and they derive food, building materials, fodder, fibers, ethnic medicines etc. and they also gather and sell various products of forest origin. Forests thus offer a reasonable source of income for the tribals. They also recognize the ecological services provided by the forests and have natural inclination to protect the same. Due to their value, forests have become part and parcel of their culture and traditions. British regime had brought in production centric forest management and created reserve forests. They concentrated mainly on two of the most valuable timbers of Indian forests namely teak and Sal and concentrated on timber exploitation and production. The mixed forests were not in their scheme of things and sometimes have been cleared and attempts were made to convert them into pure stands of Sal or teak. However, since the tribals depended on forest, they were protecting the forests as a valuable asset. The major issue, however, was dependence on the same land resource for their agriculture as the area available for agriculture was limited in most tribal areas. The traditional practice of slash and burn agriculture known as “podu” or “jhum” was blamed for reduction of tree cover in some of the areas. The increased population meant lower recuperation period for the “podu” lands thus the density and quality of forests reduced. During the British period “taungya’ system was introduced for encouraging the farmers into planting and then protecting the area till the trees grow. They were allowed to cultivate agriculture in the inter-spaces. After independence Governments have recognized the need for involving the tribals in protection of forest areas and have implemented projects for Joint Forest Management (JFM) and then Community Forest Management (CFM). Joint forest management committees were formed across the country and involving JFM committees is now seen as essential for protecting the forests. The laws and rules governing the exploitation of forests protected by communities on their own or through JFM initiatives have always been subject of heated debates and the last word has not been spoken so far on the issue. The threat of climate change due to global warming and mitigation of the same by forests as an ecological service through carbon sequestration has now been well recognized. Thus the need for protection and improvement of tree cover has attained importance more than ever and issues like who will pay for it and who will repay the same are subjects of debate now. Whether protection of forests and development of community are two conflicting ideas? Whether involving tribals in forest management could be the answer? These are the questions that need to be answered.

2. Learning Objectives

Keeping the above in view, the learning objectives of the unit are as under:

- 1) Status of Indian forests and dwindling forest wealth;
- 2) Tribals and their dependence on forest;
- 3) History of involvement of communities in forest protection;
- 4) Community management of forests;

- 5) Role of Government and NGOs in community management of forests;
- 6) Issues of benefit sharing mechanism;
- 7) Man-Animal conflict and issues of communities living within and in peripheral areas of sanctuaries, national forests and biosphere reserves; and
- 8) Issues of climate change and mobilization of efforts for protection and development of tree cover.

3. Status of Forests and Dwindling Forest Wealth

3.1. Forests and Tree Cover – Defined

Any land that is classified as forest is counted as forest land. Strictly going by this definition, an area that may have been degraded and has very little or sparse tree cover, continues to be counted as forest. The tree cover is defined as small tree patches outside the recorded forest area which are less than one ha in extent. Trees outside forests (TOF) refers to all the trees growing outside the recorded forest areas irrespective of patch size. So in India, we refer to two sets of data while talking about forest area, and total tree cover. While the first is the legal status of land, the second is the physical inventory of area with tree cover (within and outside the forest area) in the country.

3.2. State of Forest Report & Forest Survey of India

Forest Survey of India (FSI) is continuously engaged in assessment of forest cover within and outside the forest boundaries. Based on satellite data (2015-16) and inventory of TOF, the India State of Forest Report 2017 was published by FSI and the total forest area is estimated as 8, 02,088 sq. km (24.16% of total geographical area) of the country, out of which forest cover within the forest area is 21.54% and TOF is 2.85% of the total geographical area of the country. The forest cover in the hill and tribal districts of India showed an increase by 1680 and 438 sq. km respectively which can be seen as a positive sign. Overall there is an absolute increase in the area by 3775 sq. km (0.37 m ha) over the last report published in 2013, the quality of the forests becomes the important point for discussion.

FSI publishes State of Forest Report once in two years based on satellite data and this is 15th biannual report and first was published in 1987.

3.3. Quality of Forests – Issues of Density

The recorded forest area that is the land area that is notified as forest in India and Andhra Pradesh is as under:

Table 1: Legal Classification of Forest Area (sq. km)

Sr No	Recorded Forest Area	India	% of Total Forest Area	Andhra Pradesh	% of Total Forest Area
1	Reserved Forest	434705	57	31959	86
2	Protected Forest	219432	29	5069	14
3	Unclassified Forest	113881	15	230	1
	Total forest area	768018	100	37258	100
	Total Geographical Area	3287469		162968	
	% of Geographical Area	23.36%		22.86%	

All decimals rounded off to nearest whole digits and hence totals may not make to 100%

Source: Table 1.2 of India State of Forest Report 2017

The data in the above table is sourced from the records of various State Government Forest Departments who control their jurisdiction over the forest area. During the period between 2015 Report and 2017 report the additional area reported was 3452 sq. km and the addition of forest area in the country can be due to new notification of areas or due to additional area given to Department whenever a forest area is diverted to non-forest use for any development Project.

The Forest cover and “Tree cover outside forest” position in India is under:

Table 2: The Area Classification as per Tree Cover Density (sq. km)

Sr No	Class	India		Andhra Pradesh	
		Area	% of Geographical Area	Area	% of Geographical Area
1	Very Dense Forest	98158	3	1975	1
2	Moderately Dense Forest	308318	9	14051	9
3	Open Forest	301797	9	12139	7
4	Total Forest Cover	708273	22	28165	17
5	Tree Cover (outside forest area)	93815	3	3965	2
6	Total Forest and Tree Cover	802088	24	32130	20
7	Scrub	45979	1	9560	6
8	Non Forest	2439402	74	121278	74
9	Total Geographical Area	3287469	100	162968	100
	Forest Area (2015)	701495		26006	
	Increase	6478		2159	

All decimals rounded off to nearest whole digits and hence totals may not make to 100%

Source: Table 2.4 & 5.2 of India State of Forest Report 2017

It is noted that during the period between Report of 2015 and 2017, the total forest cover increased by about 6778 sq. km and contribution of Andhra Pradesh is 2159 which is very significant. The change in area under different classes is as under:

Table 3: Change in forest cover in India (2017 vs 2015)

Sr. No	Class	India	Andhra Pradesh
1	Very Dense Forest	9525	1536
2	Medium Dense Forest	-4421	-301
3	Open Forest	1674	906
	Total	6778	2141

Source: Table 2.6 of India State of Forest Report 2017

While increase in forest cover is quite significant, It may be seen that the open forests are nearly 301797 sq. km and these pose grave danger of getting further depleted and becoming “wastelands” with or without tree cover.

3.4. Wastelands in India

The data on wastelands in India is taken from Wasteland Atlas of India prepared by National Remote Sensing Centre (NRSC) for Ministry of Rural Development, Dept. of Land Resources. The data (2011) while enumerating has classified wastelands into 23 categories like gullied ravenous land, scrub land, marshy land, land affected by soil salinity/alkalinity, degraded forests, shifting cultivation-current Jhum, snow-capped mountains etc. and three of these categories are related to forest areas and classifying indicates that there is as under.

Wastelands	
Wastelands refers to the lands that are degraded land currently underutilized and are deteriorating for lack of appropriate soil and water management or on account of natural causes. – Wasteland Atlas (NRSC).	

Table 4: Wastelands in India: Select Classes (sq. km)

Sr. No	Class	India	Andhra Pradesh
1	Under utilised Degraded/Notified Forest Land-Scrub Dominated	83700	12845
2	Under utilised Degraded/Notified Forest Land-Agriculture	15680	1744
3	Shifting Cultivation- Abandoned and Current Jhum	9025	18
4	Total	108405	14607
5	Wasteland All Categories	467021	37296
6	Total Geographical Area	3287469	162968
	% of 4 out of Total Geographical Area	3.30%	8.96%
	% of 5 out of Total Geographical Area	14.21%	22.89%

Source: Table 4 of Wasteland Atlas- 2011: Ministry of Rural Development& NRSA

It may be seen that there are significant extent of area in forests which is classified as wastelands and not yielding the returns and logically not serving up to its potential for contributing to national income and also for livelihood of the communities around.

Tribals and their dependence on forests: Tribal communities that are living within and around the forest area depend on forests for food, shelter and livelihood. Their life calendar revolves around the seasonal calendar of produce from the forests and many Government plans and NGOs in their tribal plans include a seasonal calendar of produce from forests in arriving at peak and lean seasons of employment for tribal communities. The services of forests include soil conservation, fodder for the animals and eco-tourism (not so well developed and exploited in most states). Table 4 gives a list of prominent products of forests according to broad categories.

Table 5: Broad Category wise Forest Produce (sq. km)

Sr No	Item	Forest Products
1	Food	Root crops , fruits, honey
2	Shelter	Bamboo, logs, fencing materials, brush wood
3	Clothing	Fibres including silks
4	Medicines	<i>Myrobalms</i> , animal extracts, seed/ bark extracts etc.
5	Oil Seeds	Sal, kusum, mahua etc.
6	Smoking/ Liquor	Kendu/Tendu Patta (used for 'bidi making'), Mahua
7	Gums and Resins	Pine, Gum Karaya, Acacia etc.
8	Furniture and artefacts	Teak, Sal, Bamboos and Rattans.
The list can be very long and many of the products derived from forests might not have been recorded in literature even now.		

The services like carbon sequestration and mitigation potential may be relevant for climate change projects but attempts to conserve forests by tribal involvement on the plank of climate change alone may not yield much of immediate results. The livelihood of tribals and more specifically forestry as a source of livelihood is discussed elsewhere in this book and so the discussion in present unit will be limited to role of tribal communities in protection so that their livelihoods are not impaired.

Kautilya : Role of Government in Forest Protection

*Kautilya, while advising the king to select a place for establishing a new village, instructs that at the boundary line of such a village there should be a forest along with trees such as *œami*, *œâlmâlî*, milky trees, etc (Artha Sashtra .2.1.3.), which give the village a sylvan beauty. On a land not suitable for agriculture, utilitarian forests were laid down, such as, animal park, which perhaps is a type of reserved forest, for the purpose of the kings' recreation.*

History of communities involved in forest protection and voluntary efforts across the country. The role of communities and the administrators in establishment and maintenance of forests are best captured in Arthasashtra written more than two thousand years back where Kautilya advocated establishment of tree reserves along the boundary of villages.

Planting trees at the birth of a daughter which can be used at the time of her marriage after 20 years or worshipping *bargad* for some of the customs that were inherent to Indian culture and signify the role communities were involved in afforestation or protection of forests.

The instances of villagers protecting forests voluntarily were well captured in many papers and books brought by Indian Institute of Forest Management and Nira Singh in her paper beyond JFM indicates that “According to latest available estimates around 8000 villages are involved in protection and management of forests (verbal communication: RCDC, June, 2000 based on a survey taken up by RCDC), some of these have been formalised as JFM. While, some villages have been protecting forests for as long as 60-70 years, majority started protecting forests in late 1970s or early 1980s.”

Villagers evolved rules to restrict access, regulate use and impose penalties on offenders; and experimented with various forms of institutions and institutional arrangements. Protection system(s) comprised of one or a combination of arrangements such as merely keeping an eye, “thengapalli” (Odiya word for person who would use the stick or role of protector) i.e. voluntary patrolling on rotation basis or paid watchmen. Various forms of village institutions consists of Forest Protection Committee (an Executive Committee selected/ elected by the Village General body) or Council of Elders, Youth Clubs or in some cases, Mahila Samities (Singh, 1993).

In the initial years, protection entailed restricting access of outsiders to the forests as well as cutting down on own use and consumption.

All extractions from forests were restricted, in the initial years, leading to considerable hardships to direct forest dependent sections, especially head loaders.

The watershed development Projects of NABARD and Indo-German Watershed Development Projects (IGWDP) have also specific provisions pertaining to stopping the cutting of trees in the watershed area as well as the forest areas closely. The protection of forests and development of suitable benefit sharing mechanism was also part of the guidelines for the Tribal Development Projects of NABARD.

The communities in other parts of India were equally involved in protecting the forests and also the wildlife. Chipko Movement from Uttarakhand and Appiko movement from south India and role of Bishnoi tribes in protecting wild life is legendary. In nutshell we can conclude that communities involving themselves in protecting forests is age old tradition of life in Indian context.

4. Role of Government and NGOs in JFM and CFM

During British time, part of the forests were declared as Reserve forests and they were in effect declared no-go areas for any one. In Indian history, the first attempt to articulate the role of Government in forest management was by British who promulgated Indian Forests Act of 1865. This act also for the first time classified and defined the forest land. The act of 1865 empowered the British government to declare any land covered with trees as Government forest and make rules to manage it. The Act was a precursor to the much tougher and draconian Forest Act of 1878 which truncated the centuries old traditional use by communities of their forests and secured the colonial governments control over the forestry. The subsequent act was in force from 1927. If someone breaks the rules, they have

to face severe prohibition and penalties. The Khakhi of forest was seen as ultimate exploiters by tribals during British regime.

In all these Acts, the rights of tribals for taking out limited quantity of wood/fodder etc. was allowed (known as Nistars) but that was also at the mercy of local forest guards who may ask for illegal gains when tribals actually access the forests for bringing out poles/wood etc. from forests. In effect the community participation was nil and it was raj era of “working plans” where forest department decided what should be planted/protected and harvested. The phase continued almost up to early eighties i.e. 40 years after independence. The Forest Policy of 1988 after its introduction and framing of rules in 1990, gave a higher priority to environmental concerns than to earning revenue. It discouraged monocultures and promotes mixed forests. Emphasis was also placed on satisfying the minimum needs of the people, especially tribal people, by providing fuel wood and fodder. This policy gave a clear indication of the need to involve people in the conservation of forests and forest resources. The resolution of 1990 of Government of India paved way for Forest Department to involve people in the management efforts and to share economic benefits with the communities.

The role of Government in involving communities in protection of forests was borne out of many successful experiences and experiments from across the country. However, it was widely recognized that unless the dependence of communities adjacent to forests for daily needs like fuel wood, fodder, timber is brought down, the efforts will result in coercive implementation than truly voluntary efforts. Thus was borne the concept of “social forestry” or forests outside forest boundaries even before enactment of Forest Policy 1988.

4.1 Social Forestry Projects

During late eighties and early nineties almost every state government with the help of multilateral agencies initiated social forestry projects – in Gujarat, Himachal Pradesh, Rajasthan and Uttar Pradesh (World Bank and USAID), Tamil Nadu, Bihar & Orissa (Swedish International Development Authority- SIDA), Andhra Pradesh (Canadian International Development Authority-CIDA), Karnataka (Overseas Development Authority-ODA), and Madhya Pradesh and Maharashtra (USAID). The essence of these projects was to develop village woodlots, agroforestry and also trees in the backyards, etc. While the woodlots in private lands remained owners’ property, the produce and usufructs from the community woodlots were having definite benefit sharing mechanism.

Social forestry

The management and protection of forest and afforestation of barren and deforested lands with the purpose of helping environmental, social and rural development is known as Social Forestry. The term, social forestry, was first used in India in 1976 by The National Commission on Agriculture, Government of India. It was then that India embarked upon a social forestry project with the aim of taking the pressure off currently existing forests by planting trees on all unused and fallow land.

Social forestry is basically for the people by the people and of the people approach.

4.2 Joint Forest Management and JFM Projects

The Joint Forest Management (JFM) is one step ahead of Social Forestry as it was first time that 'Government owned forests' namely the reserve forests and other forests with regard to community participation under control of forest department were planned to be managed by community participation in return of which Government has well laid and documented strategy and plan for sharing the resources that are accruing from such jointly managed forests. Under such JFM Projects, the villagers in fringes of such forests were organised into JFM committees (which may or may not be registered) and elaborate exercise of natural resource mapping and development plan for the same ere prepared in almost all States. Thus it was a major role switch for the forest dept. officers/staff who were hitherto as "dandawala" or by the communities, they were now required to mingle with the community and they were together protecting the forests. However, major thaw was what is sought to be shared – is it incremental income i.e. over and above what forest department was already getting or total income? Whether the benefit sharing is for Non-Timer Forest Produce or is it for all types of income including timber and may be mining etc.

There were cases where the community was already protecting an area and it was not recorded by the Forest Department and formalized. In such cases, whether the benefits that were accruing to formal JFM committees can be extended. While these frictions were there, it can be definitely be said that forest department has assumed role of mentor and guardian of JFM committees from erstwhile role of owners, protectors and administrators of forests (We need to understand that even now the designation(s) of forest department officials at different levels is "PCCF/CCF/CF/DF etc. and they are Conservators of forest").

4.3 Community Forestry Management

The Community Forest Management (CFM) as propagated now is absolute involvement of community in management of forests and more passive role for forest department. Though in its pure form, the community forestry would mean community ownership of forests, the same is not legally tenable in India as the Government (through Forest Department) continues to own forest land and resources in it. Similarly, any deviation in laid down approach of forestry conservation will have to be dealt with by Forest Department. It needs to be remembered that the Forest Conservation Act of 1980 prohibited the use of forest land for non-forestry purposes. It also prohibited the establishment of plantations of horticultural crops, palm oil trees, or medicinal plants on forest lands without prior permission from the Government of India. So the community choice and preferences may lie in some of the trees/ species which may in their opinion yield "commercially desirable outputs" that community can collect and sell for profit. But the basic tenant of well managed well stocked tree species will be first preference of forest department. In such cases, the conflicts are bound to happen and they need to be solved upfront.

4.4. Role of Government and NGOs in JFM and CFM

The role of Government as the owner was to legislate and implement the policies and they also acted as owner and conservator of forests. The role of NGOs had been a matter of debate throughout the history of forest conservation. Some of the foresters and planners have seen them as obstructionists in conservation efforts as NGOs were advocating JFM

and CFM and also for tribal rights. However, the bright examples of NGOs and communities handheld by them have proved to be oasis in desert. There were many cases recorded where NGOs could mobilise the communities to protect the forests.

The issues were as under:

- Whether the community which has protected forests also has some rights.
- The fundamental question was also “whose forest it is any way”.
- “The forest ours and British have snatched it from us and now forest department has inherited it”.
- It was also argued by activists that despite very strict laws and enormous powers for implementing, the forest under control of Government has continued to degrade, hence, what use these laws are of?

While the answer to any of these arguments cannot be definitive, there are merits in each of these arguments.

Based on these arguments and seeing successes of many NGO driven initiatives, it has been decided that NGOs with strength in community mobilization and local presence need to be involved in such JFM projects. While initially, their role was limited to training of community on sustainable natural resource management, governance and handling of cash etc., later on they were also involved in various community driven activities like establishment of primary processing units for NTFP and also for devising plans and also implementation of such plans in ground level. The role of some of the agencies like Vasundhara and RCDC in Odisha, Foundation for Ecological Security (FES) in Andhra Pradesh, Odisha, MP, Gujarat and Rajasthan, IFFCO in Rajasthan, UP, MP, RCDC in Odisha, ARTS in AP is really commendable. However, it needs to be mentioned that there were many unsung heroes among communities who contributed to thought process and successful implementation of community initiatives in forest protection. It needs to be said that the agencies were working closely with Government and were part of some or other Government run projects.

At present it can be safely said that there is hardly any scheme or project concerning forestry management that does not envisage involvement of tribal communities in the same. This is a highly commendable achievement on the part of the Government of India, State Governments and all other stakeholders.

5. Issues of Benefit Sharing Mechanism, Its Accrued Benefits or Incremental Accruals/Benefits

In this context, benefit sharing mechanism, as the name suggests is all about who has rights to benefits accruing from any effort or project. The biggest issue that affects any project is feeling of being cutoff or deprived from the fruits of labour. While designing the project itself, the following issues have to be taken care.

- Are there customary or legal rights given to local population on the products from the forest area?
- Are they codified and have approval of the local community groups?

66 • Natural Resource Management and Biodiversity

- Whether the new system diverges from earlier practices?
- If so has it been discussed in panchayat /gramsabha?
- What issues were raised during such sabhas and have they been amicably solved and settled. Have they been recorded?
- Whether the rights of people based on principles of equity have been adopted wherein the last and least also has right to access the benefits with reasonable costs?
- Whether individual will access the produce or the panchayat or JFM committee will access and distribute the benefits?
- What are the mechanism for preventing the overuse or misuse of rights by individual or group as a whole?
- Whether penal provisions have been recorded and accepted by one and all?

As the protection of forests and access to benefits have close relationship and they have lot of bearing on livelihood of tribal communities, the issue is discussed in the unit on livelihood in more detail.

6. Man Animal Conflict and Issues of Communities Living Within and In Peripheral Areas of Sanctuaries, National Forests and Biosphere Reserves

The role of animals in food chain and bio-diversity is well understood. At the same time it is also to be understood that tribal communities have been dependent on animal protein for the food from time immemorial. The hunting of animal for trophies by kings and later equally by British was also part of our history. Due to unscrupulous hunting the situation in past became so grave that tiger population has come down to few thousands in 1970. For reversing the situation, India embarked on “Project Tiger” in early 70s and though the name suggests about “tiger”, it was about protecting not only tiger but the whole habitat so that all the animals and forests are protected. Now hunting of wild animals is strictly banned and the areas with higher density of animals have been earmarked as sanctuaries/ national parks and biosphere reserves. However, the loss of areas and also degradation of habitat has put the animals in danger and also the communities living in periphery of such protected areas. Straying of wild animals particularly elephants (annual raids on cropped areas and villages), lower carnivores, simians and nilgai etc. have been major issues in some parts of the country or other.

In the same context another issue is relating to relocation of tribal villages situated within the core area of sanctuaries/national parks/ biosphere reserves so that animal protection is better ensured. Whenever such relocation is attempted, the tribal communities are seriously affected as they find it difficult to adjust in the new location. Whether the idea of such relocation is successful in protecting the animals is a question that will be answered only after twenty or thirty years when we take a census of animals. However, for the time being seeing tribal communities as an enemy of animals is highly debatable.

7. Issues of Climate Change and Mobilization of Efforts for Protection and Development of Tree Cover

The threat of global warming and its impact on humanity is now recognized more than ever. The rising level of greenhouses gases and their relation with global warming is also well recorded. Trees are the one of the very few living organisms that can actually reduce carbon dioxide through photosynthesis. In view of this, the forests are major contributors in mitigation through carbon sequestration (a process by which carbon dioxide in atmosphere is captured and carbon is stored in various parts of plants and oxygen is released during photosynthesis). There is call for preserving existing forests and increasing efforts for afforestation and reforestation. However, such efforts in some cases directly come in conflict with increased demands for land for other development efforts and also harvesting of trees for meeting the increased demands of wood for fuel, building materials, paper etc. The global warming is also leading to increased “high intensity weather events” like storms, dry/wet/cold spells etc. The water resources within forest area may also be dwindling and communities and animals may be adversely affected. In view of this, protection of forests for the mitigation efforts of the global community is the need of the hour. However, how the local communities that are involved in this cause will be compensated and how their current and emergent needs from existing forest will be met is a major challenge. Harnessing alternate energy sources like wind and solar may solve the needs of heating and lighting to some extent but finding alternatives for building materials and paper seem to be very difficult. The only option is large scale agro forestry or community forestry efforts in wastelands within or outside forests is the only solution for this problem.

After the 2007 United Nations Climate Change Conference at Bali also known as Conference of Parties 13 (COP-13) held under aegis of UNFCCC (United Nations Framework Convention on Climate Change), countries have discussed widely on action required for climate change mitigation and have adopted that:

Enhanced action on mitigation of climate change includes, inter alia:

- Nationally appropriate mitigation commitments or actions by all developed countries.
- Nationally appropriate mitigation actions (NAMAs) by developing countries.
- Cooperative sectorial approaches (CSAs) and sector-specific actions.
- Ways to strengthen the catalytic role of the convention.

This is a deviation or rather improvement from earlier proposals for Globally Appropriate Mitigation Action or one solution for all ills or “one size fits” all approach. There were also wide discussions on role of forestry. It is resolved that the nations pledge “policy approaches and positive incentives” on issues relating to reducing emissions from deforestation and forest degradation (REDD) in developing countries; and enhancement of forest carbon stock in developing countries. This paragraph is referred to as “REDD-plus” in the UNFCCC parlance. The efforts for such improvement of forests are now to be seen as development and retention of carbon sinks for combating climate change.

8. Summary

The tribal communities and forests are conjoined twins and any attempts to develop one without the other will not bear fruit. In fact, such attempts can be counterproductive in the long run. Development of natural resources and sustaining them without actually harvesting the fruits of the same for the larger good of the community does not make economic sense. Similarly, forest have to be seen as one of the important community managed assets and management by community with sense of pride, responsibility and possession can help in sustaining and development the forest wealth. The design of projects for development of forests have to be in junction with community needs and needs of individuals within the community. The benefit sharing mechanism has to be robust and so also the distress sharing mechanism. The man animal conflicts have to be seen as new normal and have to be resolved by accommodation on the part of humans as well as managers of animal reserves.

The global warming and climate change is real and existing wastelands within and outside have to be brought under tree cover with innovative ideas and national and international funding. However, such efforts have to be community driven at the local level and solutions as conference of parties of UNFCCC puts in their “Bali conference” are to be Locally Appropriate Mitigation Action (LAMA) rather than Globally Appropriate Mitigation Action (GAMA)

9. Recapitulation

- What do you understand by Forest Cover and Tree Cover?
- How do you think tribals are dependent on forests?
- What do you understand by Community Managed Forests, Joint Forest Management and Community Forest Management?
- What is Benefit Sharing Mechanism?
- What is the role of Government and NGOs in forest management?
- What are the issues in regard to ‘Man Animal Conflict’?
- How do you think the call for preserving existing forests and increasing efforts for afforestation and reforestation for addressing the concerns of climate change come in conflict with increased demands for land for other development efforts?

10. Key Terms

Joint Forest Management (JFM), Community Forest Management(CFM), Usufrutory Rights, Green Revolution, Intensive and extensive agriculture, Primary processing, BGREI, WDF, TDF, Wadi, SHGs, JLGs, FPOs, NABARD, NGOs, UNFCCC, NRM, LAMA and GAMA.

11. Activity

- Find out what role can NGOs play in designing and implementation of plantation projects on commercial scale in tribal areas?

- Find out the concerns of the tribals in regard to afforestation project that you propose in the forest accessed by the tribals.

12. References

- Ministry of Environment and Forests: JFM Hand Book: Capacity Development for Forest Management and Training of Personnel: JICA Funded Project (ifs.nic.in/Dynamic/pdf/JFM%20handbook.pdf)
- Ministry of Rural Development-Department of Land Resources& NRSA- Wasteland Atlas-2011 http://www.dolr.nic.in/WastelandsAtlas2011/Wastelands_Atlas_2011.pdf
- Strengthening of Joint Forest Management, Ministry of Forest, Environment and Climate Change, Government of India: (<http://www.moef.nic.in/sites/default/files/jfm/jfm/html/strength.htm>)
- Neera M. Singh.2001. Community Forest Management vs. Joint Forest Management in Orissa Need to look beyond JFM (<http://vasundharaodisha.org/download22/CFMVsjfm.pdf>)
- Peasant Mohanty.2011. Conservation Reserve and Community Reserve in Odisha: A Study on the Potentials and Initiatives Taken so far Research and reporting - Study commissioned by: Regional Centre for Development Cooperation (RCDC) (www.rcdcindia.org, www.banajata.org)
- Tapas Kumar Sarangi.2015. Forest Rights Act, 2006 in Protected Areas of Odisha, India: Contextualising the Conflict between Conservation and Livelihood: IEG Working Paper No. 355. (<http://www.iegindia.org/upload/publication/Workpap/wp355.pdf>)
- Ministry of MOEF&CC: For the Future of Forests, Joint forest management: Case Study (<http://www.moef.nic.in/divisions/ic/wssd/doc3/chapter3/css/Chapter3.htm>)
- Sudha, P., Indu K. Murthy & N.H. Ravindranath.2017. Methodological and Technological Issues in Technology Transfer: Case Study 25 Tree Growers' Cooperatives: A Participatory Approach to Reclaim Degraded Lands: Centre for Ecological Sciences, Indian Institute of Sciences, Bangalore (<https://books.google.co.in/books?isbn=0521804949>)
- Government of India. 2006. National Policy On Tribals (Draft). http://www.prsindia.org/uploads/media/1167469383/bill53_2007010353_Draft_National_Policy_on_Tribals.pdf
- Manubendu Banerjee : Kautilya's Arthashastra on Forestry. <http://www.sanskrit.nic.in/SVimarsha/V6/c9.pdf>
- Forest Acts, Policies and Land Settlements http://webcache.googleusercontent.com/search?q=cache:http://lib.icimod.org/record/2346/1/files/c_attachment_234_2518.pdf&gws_rd=cr&dcr=0&ei=IkFTWsqLmN5vATk84O4AQ
- UNFCCC. 2007. Bali COP-13 https://en.wikipedia.org/wiki/2007_United_Nations_Climate_Change_Conference Involving Tribals in Forest Management.

6

Managing Man-Animal Conflict in Tribal Areas

There is "blame game" and "witch hunting" process going on the rampant man-animal conflict since the recent past. One comment in this regard is, "what is needed is serious introspection. Society, which consists of all of us, needs to take the blame in its own capacity rather than pointing fingers at others individually. What will be essential is an empathetic attitude toward those suffering and a willingness to assist with their needs to the best of our abilities. If we are all sincere in fulfilling our own pledge to help protect the environment, positive results are bound to come today and tomorrow" (Basu 2013).

Source:

Basu, Saikat Kumar. 2013. Man-Animal Conflicts in India: Understanding Hidden Social Factors. Livebetter Magazine. Center for a Better Life. <http://livebettermagazine.com/article/man-animal-conflicts-in-india-understanding-the-hidden-social-factors/> accessed on 8.4.2018.

- *Do you agree with the above comment?*
- *What reasons would you attribute to this "blame game" about conflicts of man- animal in tribal areas?*

Contents

1. Introduction
2. Learning Objectives
3. Conflict
 - 3.1. Causes of Conflict
 - 3.2. Deliberate Acts of Humans to Kill the Wild Animals
 - 3.3. Consequences
4. Impact on Wild Animals
5. Dealing with Conflicts
6. Summary
7. Recapitulation
8. Key Terms
9. Suggestions
10. Activity
11. References

1. Introduction

There has been a continuous conflict between humans and animals since time-immemorial, one can see it part of nature and various species on earth try to overpower nature and control its resources. Some balance however was maintained for quite a long time. Gradually human-wildlife conflict occurred acutely when the needs and behaviour of wildlife impacted negatively on the goals of humans or when the goals of humans negatively impact the needs of wildlife. As human beings established supremacy using various mechanisms, other animals have been controlled. Over the years the human beings have occupied the territories of animals and destroyed them and thus created an imbalance. As a result, the spaces of animals are shrinking which left animals with no choice other than entering into the spaces occupied and inhabited by humans. Besides this, with large scale destruction of forest spaces for the extraction of minerals and establishment of infrastructural projects ruining of the harmonious relations between man and animal has taken place. This, in fact, is the case with all the developing countries in the world. The rapid industrial development in the past three decades and the construction of dams and other projects have caused fast shrinking of the protected areas in India. This led to frequent man and animal encounters often ending in conflict resulting in the endangerment of the latter. The pressure on inhabitable space is increasing with the increasing population density over decades, affecting the landscape by increased urbanization space. Drastic depletion of the forest area and urbanization has significant impact on the mobility of animals, forcing the latter to enter the human habitations. Human-animal conflict has emerged as the major crisis point in the peripheries of the forest with the change in land use pattern in rural areas. The damage and destruction caused by a variety of animals to human life, crops and other property is often retaliated. The animals are often killed, captured, or otherwise harmed. Such conflicts have become one of the main threats to the continued survival of wild species. The process of climate change is likely to increase the conflict and cause loss of wildlife habitat by worsening the already persisting problem of floods and droughts. Such phenomena will sure to force the wildlife to migrate to new areas as a way of adapting to the changes. This may further aggravate the human and animal conflict.

2. Learning Objectives

- 1) Understand the causes and consequences of man-animal conflict;
- 2) Examine the perceptions of forest dwelling communities on conflict with animals;
- 3) Delineate the harmful practices of humans;
- 4) Strategies to resolve human-animal conflict; and
- 5) Solutions with modern management strategies.

3. Conflict

The main cause of human wildlife conflict worldwide is the competition between growing human populations and wildlife for their living spaces and access to resources. There has been transformation in the forest ecosystems as a consequence of the increasing demand for land, food production, energy and raw materials. The forest areas of Andhra Pradesh

are largely inhabited by the tribes. The forest region of Vishakhapatnam, Vizianagaram and Srikakulam districts hosts a wide variety of tribal communities. They include Bhagata, Kondadora, Khond, Kondakapu, Valmiki, Kammara, Gadaba, Kotias, Porja, Nookadora, Jatapu, Konda Savara, Kapu Savara, Maliya Savara and Yerukala communities. The forest

A 10-ft.-long python created a flutter in AP Model School at Gudupalle close to the Dravidian University in Kuppam. It was killed by local farmers (The Hindu 2016).

A spotted deer strayed into the human habitation in Kuppam town from the Maharaja Kadai forests in Tamil Nadu. On being informed by the residents, the forest officials caught the animal and released it in deep forests (The Hindu 2016).

region of East Godavari and West Godavari districts are inhabited by Konda Reddis, Kondakammara, Konda Dora, Kondakapu, and Valmiki communities. The forest regions of Guntur, Krishna, Prakasam, Kurnool, Nellore, and Chittoor are inhabited by Yanadi, Chenchu, Nakkala and Yerukala communities. These tribal communities use the resources of the forest for the fulfillment of their basic needs but not wants. Those traditional dwellers are known for efficient management of resources. Such management takes the needs of all living beings of the territory into consideration. Their knowledge allows them to design strategies to avoid conflict with animal. For example, Chenchu community of Andhra Pradesh and Telangana designates the spaces for various animals live in the forest. Although it is primarily a hunting and food gathering community, they do not ruthlessly hunt the animals, and moreover the game is not for commercial purposes. Usually, they do not kill the endangered species. Whenever they find depopulation of particular animal, the traditional council or *kula panchayat* orders the community members to abstain from hunting that animal. Since the boundaries of villages are demarcated, the people of a particular village or set of villages in a particular territory are aware about the movement of the animals. They resume hunting of that particular animal only when they find it in abundance. Since they knew the spaces of animals, they try often not to encounter the animal directly. However, such avoidance and other traditional mechanisms are gradually dying out with the shrinking space, migration of the traditional dwellers, the increasing presence of outsiders and illegal poachers. Such transition has been escalating the conflict between human and animal over a period of time.

There have been several such incidents reported on regular basis. This reveals the seriousness of the problem. The above-mentioned incidents convey several important ideas.

- ✓ perceptions of people on wild animals,
- ✓ varied responses of people,
- ✓ the response of forest officers,
- ✓ the scope for awareness, and
- ✓ the scope and need for collaboration between Forest Officers and local communities.

3.1. Causes of conflict

The causes of conflict are multi-dimensional. To note a few:

- *Deforestation*

It is happening for the cultivable land, habitat, industrial use and other development related projects. But, afforestation is not taking place as rapidly as deforestation. In some cases, afforestation does not occur at all. The wildlife zones have been fragmented. As a result, wildlife has to confine to smaller pockets. This is increasing the contact between humans and wildlife. The buffer zones of the reserve forests are the significant conflict zones. The wild animals also stray from protected areas to nearby field, villages and urban dwellings.

- *Scarcity of water resources within the forests*

The water bodies of the forest are either occupied or over used for cultivation and industrial purposes. The scarce resources are not managed well. They are also getting polluted with the increasing industrial establishments and the search for minerals. The wild animals move in the buffer zones in search of resources.

- *Expansion of human habitations into wildlife habitats other than those traditional forest dwellers*

Increasing population density escalates the need to stretch into wildlife zones and make them inhabitable to humans. This human need deprives the animals of their spaces. These resource rich regions attract wide variety of outsiders. The non-tribal communities who are not the original inhabitants of the forest territories also move towards forest areas in search of resources. They use the resources of the forest for commercial use. This effects not only the carnivores but also the herbivores.

- *Establishment of extraction industries*

The rapid industrial development in the country increasing the need for extraction of minerals from its remote soils. Such industries are seen as those causing displacement of humans. But, the impact of such industries on wildlife is largely ignored.

- *Highways and other infrastructural development projects*

The industrial development and other modern development initiatives need better transportation and other infrastructural facilities. The road and rail networks passing through reserve forests poses serious threat to wild animals. They often restrict the mobility of the animals and causing accidents. The food provided by the travelers poses threat to wild life.

- *Dams*

Large dams intended for irrigation and power generation submerges huge tracts of land which displaces and takes the life of large number of wild-animals. The dam construction sites turn to be small towns in post-construction phase which attracts a lot of non-tribal communities to these regions. For eg. Sunnipenta and Nagarjuna Sagar areas of Andhra Pradesh increased by size from small tribal hamlets.

- *Tourism projects*

Tourism projects including eco-tourism are turning to be harmful for the wildlife. Probably, overenthusiasm of tourists, lack of sensitivity to wildlife, making the wildlife habitats as garbage bins with plastic waste, loud speakers in the vehicles disturbs the wildlife.

- *Lack of sensitivity and wisdom for those new dwellers unlike traditional inhabitants*

The new dwellers do not have the traditional wisdom on wildlife, behaviours of animals, spaces of animals and their movement. This often results in confrontation.

- *Climate change*

It's an overarching phenomenon. The climate change altering the conditions of ecosystem. Drought, floods and seasonal changes are a few of its side effects. This disturbs the wildlife habitats and increases the avenues for conflict with humans.

3.2. Deliberate Acts of Humans to Kill the Wild Animals

- Techniques to safeguard the crops result in several animal deaths. Eg: traps, electric fences and poisoning.

- *Traps, firing, poisoning and acid bombs by poachers*

Poaching is a serious threat to wildlife. As per the Wildlife (Protection) Act 1972, poaching is a crime. It is punishable up to 7 years of rigorous imprisonment. However, poaching remains a serious threat to the wildlife. Few solutions can be worked out in collaboration with forest dwelling communities to tackle this threat.

- *Non-regulated hunting activity of a few communities*

As the man gets deeper into the spaces of animals, the animals get into those encroached spaces of humans. As a result, animals move to the periphery and come close to their human counterparts. Damaging the habitats of animals and depriving them to a smaller territory aggravates the animals. In such cases, wild animals attack on humans or domestic livestock. In Tamil Nadu, the human-animal conflict has claimed at least 185 human lives, and more than 132 of elephants and tigers were killed between 2013 and 2016.

The attack on a three-year-old boy, Sk. Arshad, in the forest near Yerragondapalem in Prakasam district by a wild boar on Saturday once again brought to the fore the intensity of human-animal conflict (Murali and Umashanker 2015).

A 60-year-old Chenchu man, Naganna was mauled to death by a bear near Chinabodu, 30 km from Yerragondapalem in October 2013 and another 45-year-old tribal A. Musalaiah was seriously injured in an attack by a pair of bears near Garepentagudem in Pullalachervu mandal in June 2012 (Murali and Umashanker 2015).

Keesarabodu Tavitayya, a 70-year-old tribal from Eguvaragada village in Andhra Pradesh's Srikakulam district, was killed in November 2016. He was walking through the forest while returning from a family wedding nearby, when he was trampled by wild elephants, which then dragged his body for over two kilometers (Radhakrishna 2017).

There have been several such incidents regularly reported in newspapers and several others goes unreported all across the forest areas of Andhra Pradesh and in the entire country. This signifies the increasing conflict between man and animal. This results in mutual hatred. For example, the animals with strong memory such as elephant turn against farmers in retaliation to farmer's attacks on them (Ramakrishnan 2017).

But, wild animals do not automatically attack the humans. They usually attack for the following reasons:

- When they feel threatened.
- To defend their offspring when they sense any trouble to their young ones.
- When somebody intrudes into their territory in forest areas.
- When wild animals are old, sick or injured and are unable to hunt in forest.
- When an animal is caught by a surprise or otherwise frightened, their basic instinct is to attack.

3.3. Consequences

- *Human death and injuries are the most severe consequence of human-animal conflict*

Injuries to people mostly occur as a result of encounters with elephants, wild boars, tigers and leopards, usually along paths between dwellings and a water source in forest areas and also when these wild animals stray out of the boundaries of protected areas in search of food. Most of the encounters results in permanent injuries and in some cases death of humans. The consequences of these attacks go beyond the victim. Such incidents threaten and enrage the entire community. The death of a family member caused by a wild animal is a traumatic experience. For a poor tribal family, the death or injury of the bread-winner can mean the difference between a secure life for all and one of destitution where simple day-to-day survival becomes a priority. Therefore, attacks by wild animals can jeopardize the livelihoods of the entire families.

- Incidents of crop damage are of the most prevalent manifestation for human wildlife conflict across the world (Parisara Envis Newsletter 2015). A wide variety of animals including birds, rodents, wild boars, bears and elephants disturb farming activities.

The destruction of natural vegetation around protected areas and in some cases the total disappearance of buffer zones force herbivore species to feed in cultivated fields. This phenomenon is on the increase because the growth rate of cultivated areas is high at the periphery of protected areas.

- *Domestic animals are killed by predators*

Attacks on livestock is a major concern in some tribal areas where pastoralism remains the main source of livelihood for many people. In fact, effective protection and habitat management within the national parks has increased the population of wild animals which has resulted in straying out of the park boundaries into the local villages in search of food, water and space. The decline in the numbers of natural prey is one of the major reasons for the attacks of the carnivores on the domestic livestock which are easier to capture and have limited possibilities of escape. On the other hand, animal husbandry programmes increasing the presence of livestock. However, number and type of domestic animals killed

by wildlife varies according to the species, the time of year, and the availability of natural prey. As a result, the competition is increasing for grazing tracts between domestic livestock and the wildlife. This pulls man into conflict with the wildlife.

- Serious diseases are known to be transmitted by wildlife to domestic livestock and possibly also to humans (i.e. rabies). Scavengers and predators, such as wild dogs, jackals, lions and vultures play a role in disseminating pathogens by opening up, dismembering and dispersing parts of infected carcasses. Foraging by domestic cattle in wildlife habitats results in transmission of diseases such as foot and mouth disease.
- *Effect on income and food security*

The attack and capture of livestock and crop damage by wild animals pushes pastoralists and cultivators into financial burden. The devastation of crops also effects food security.

4. Impact on Wild Animals

- Humans retaliate when somebody killed or injured by wild animals. Similar response is also true in case of the raids by wild animal on the agricultural land. In such cases, the most common human response is to kill a single animal or sometimes the whole local population of that animal. This seriously affects endangered species. Such impact also spread to the entire ecosystem and influences the equilibrium and biodiversity.
- Competition for grazing lands between domesticated animals and wild animals increases the intervention of humans in favour of domestic animals.
- Several species of larger carnivores such as tiger and leopards have been facing threat of eviction from a large part of their natural habitats because of conflict with humans.
- Pollution of water bodies with the industrial establishments in the habitats of wild animals causing serious damage to wildlife.

5. Dealing with Conflicts

Dealing with conflicts is like a double-edged sword. The conflict mitigating agency must sensibly act on it. The major task is to understand the perceptions of people. There is often a possibility for the difference between the perceptions of people and the forest officers. Such difference act as a major constraint in dealing with conflicts. For example, “Two villages in the core of Kawal Tiger Reserve in Telangana have agreed to relocate to the fringe of the forest, raising hopes among the forest officers of making the sanctuary free of human interference – crucial for tigers to settle down” (Sreenivas 2018). This sounds one-sided and damaging. Whether a forest should be free of human or a better interface should be established between humans and animals is a contesting issue. A careful assessment of local conditions is essential to avoid conflict between people and officers before solving the conflict between humans and animals. There must be mutual trust between people and the officers for a common cause. The practices of people worth appreciation in this context. For example, the Chenchus of Andhra Pradesh and Telangana classify the forest into different zones. They avoid the human activities in some zones of animal concentration.

The resource maps, forest classificatory maps and the activities based maps would be helpful in reducing the conflicts between humans and animals. The forest officers may

The news lines are probably more damaging than constructive. They escalate fear among people. They are afraid of losing their homeland. They believe, forest officers as well as animals as their common enemy. There is a possibility to spread rumors over such issues before officers reach out to them. It becomes a larger conflict and overshadows the protection of the animal. Therefore, conflict mitigation strategies must be very carefully designed in order to protect biodiversity. As the ultimate consideration would be reasonable human cause, the human may be prioritized while working amicable solutions. Therefore, the humane idea would naturally demand the participation of all the stakeholders while not causing harm to wildlife.

6. Summary

The conflict among various species in the ecosystem is inevitable. Some balance however was maintained for quite a long time. Gradually human-wildlife conflict occurred acutely when the needs and behaviour of wildlife impacted negatively on the goals of humans or when the goals of humans negatively impact the needs of wildlife. There has been transformation in the forest ecosystems as a consequence of the increasing demand for land, food production, energy and raw materials. The large scale destruction of forest spaces for the extraction of minerals and establishment of infrastructural projects escalating the conflict between man and animal. The forest areas of Andhra Pradesh are largely inhabited by the tribes. These tribal communities use the resources of the forest for the fulfillment of their basic needs but not wants. Those traditional dwellers are known for efficient management of resources. Such management takes the needs of all living beings of the territory into consideration. Since they knew the spaces of animals, they try often not to encounter the animal directly. However, such avoidance and other traditional mechanisms are gradually dying out with the shrinking space, migration of the traditional dwellers, the increasing presence of outsiders and illegal poachers. The frequent man and animal encounters resulting in the endangerment of the latter. The pressure on inhabitable space is increasing with the increasing population density over decades, affecting the landscape by increased urbanization space. Drastic depletion of the forest area and urbanization has significant impact on the mobility of animals, forcing the latter to enter the human habitations. The animals are often killed, captured, or otherwise harmed. In this context, it is essential to identify the zones of conflict and understand the perceptions of the forest dwelling communities to design a strategy to mitigate the conflicts.

7. Recapitulation

- Why understanding the perceptions of people is essential in dealing with man-animal conflict?
- What are the major sources of conflict?
- What measures are required for bringing down the man-animal conflicts?
- How is community participation important for finding area specific solutions?

8. Key Terms

Human-animal, conflict, forest-based communities, management strategies

9. Suggestions

Managing conflicts require the implementation of short term and long term strategies. The following strategies would be helpful to prevent human wildlife conflicts.

Establishing working groups

- Form small groups with tribal people. One forest officer at appropriate level in hierarchy can serve as a coordinator. These groups review emerging issues in the man-animal conflict. They develop strategies to address such conflict.
- The representatives of the government and nongovernment organizations (GO and NGO) may enter into partnership for the common cause. They must review the situation time-to- time and make necessary recommendations.
- Build the knowledge-base and expertise to prevent human-wildlife conflict.

Commitment to collaborative action

- Understanding the perceptions of people regarding wildlife and its protection.
- Learning and documenting traditional knowledge of forest dwellers in maintaining the exclusive zones of variety of wildlife and strategies of protection.
- Create awareness among the forest dwellers about wildlife and its various dimensions.
- Secure the support of forest dwellers and other stakeholders.
- Develop common goals and build consensus to address human-wildlife conflicts.
- Uninterrupted engagement with local communities is needed to foster the partnerships to effectively implement the strategies.
- Identify unambiguous roles and responsibilities for various stakeholders.

Addressing short-term and long-term issues

- Develop illustrative materials to educate forest dwellers and other people at the buffer zones on wildlife movement.
- Develop and disseminate sustainable solutions to protect farmers from crop damage.
- Identify grazing zones for domestic animals and educate local communities on the same.
- Connect cultivators to enable them to share the best practices in crop protection which do not harm the animals.
- Incentivize the efforts of community conservators.
- Develop and promote the best techniques and management practices to mitigate human- wildlife conflicts.

Outreach and mass ecological education programmes

- Educate the public about ecosystem, wildlife, endangered species and the need to conserve nature.
- Incorporate information regarding human-wildlife conflicts into educational curriculum at all levels.

80 • Natural Resource Management and Biodiversity

- Inform the public about the actions of humans which result in human-wildlife conflicts.
- Create awareness about conservation activities and acknowledge the role of community conservators in the management of wildlife and addressing the conflicts.

Mandatory action to be taken by the Forest Department

- The Human wildlife conflict zones to be identified and marked on ground and maps.
- Use of technology like cameras, drones and radio tagging (if necessary) of wild animals may be adopted.
- Improving the mobility of Forest personnel like vehicles (Jeeps & Motor Cycles), all terrain vehicles, darter guns immobilization equipment should be procured and used extensively.
- Regular training programmes for staff and tribal youth should be held.
- The local tribal youth should be employed as Forest guards.
- Simple procedures and delegation of financial powers to district level officials to pay compensation towards damage caused by wild animals to crops and property should be put in place.
- A separate 'Head of Account' to be opened titled payment of compensation towards damage and loss caused by wildlife to crops, life and property so that required amounts are budgeted every year by the Finance department.
- Relocation of villages may be done with the consent of people and compensation towards allocation of land, house, cash, and education should be made an attractive package.
- The Forest Range offices should be open on 24x7 basis like police stations in the territorial areas and wild life sanctuaries.
- The Forest Department should take full responsibility of taking injured persons to govt./private hospitals and attend to them till they are discharged from hospital.

10. Activity

- A small hamlet is located in the core area of the forest. That location is popular for a specific animal. You believe that the presence of human habitations is causing the damage to that particular species. How do you solve the problem?
- List all the possible consequences of conflict between humans and wild animals.
- Who do you think have to be prioritized in case of human-wildlife conflict?
- What are the important aspects to be taken into consideration in the human-wildlife conflict?
- What are the treats and challenges to the administrators in dealing with human-wildlife conflict?

11. References

- Murali, S, and K. Umashanker. 2015. Rattled By Raids, Farmers in Two Districts Change Cropping Pattern. *The Hindu*, October 25.
- Parisara Envis Newsletter. 2015. Need for Calm Coexistence. No. 37. 1-23.
- Radhakrishna, G. S. 2017. Drought in the Eastern Ghats: Man-animal conflict rise in Andhra Pradesh, Telangana over receding groundwater. *Firstpost.*, May 19.
- Ramakrishnan, S. 2017. Human-Animal Conflicts on Rise in Tamil Nadu (India). *The New Indian Express*, September 10.
- Sreenivas, J. 2018. To Free Telangana Tiger Reserve of Human Interference, Forest Officials Hope to Relocate 37 Villages. *The Indian Express*, January 3.
- Sukumar, R. 1994. Wildlife-human Conflict in India: An Ecological and Social Perspective. In (ed) R. Guha. *Social Ecology*. New Delhi: Oxford University Press.
- The Hindu. 2016. Human-Animal Conflict: Python enters classroom, deer strays into Kuppam. *The Hindu*, September 23.

7

Biological Diversity Act 2002

"The interactions between intellectual property rights regimes and bio-diversity management remain an evolving and unsettled issue at the international level. This notwithstanding individual countries like India must put in place legal frameworks for the management of biodiversity that make a coherent whole... the existing national regime is insufficiently concerned" (Cullet and Raja 2004:94).

Source:

Cullet, Philippe and Jawahar Raja. 2004. Intellectual Property Rights and Biodiversity Management: The Case of India. *Global Environmental Politics*. 4.1: 97-114.

- *What would be your response to the above observation?*
- *What legal frameworks do you think for the Biodiversity Act of India?*

Contents

1. Introduction
2. Learning Objectives
3. What is Biological Diversity?
4. Biological Diversity Act 2002
5. Salient Features of the Act
6. Regulatory Mechanism
7. Functions of the Governing Bodies
8. Issues in Regulatory Mechanism
9. Summary
10. Recapitulation
11. Activity
12. Key Terms
13. References

1. Introduction

The term Biodiversity/ Biological Diversity began to be used in its contemporary sense since the 1980's when the importance of ecological balance and biodiversity conservation was fully realized at a time when population increase was at its peak. As a result, global biodiversity levels are falling at a disproportionate rate which is a serious case of concern. The increased significance of biodiversity resulted in Convention on Biological Diversity (CBD) and also the ratification of the CBD in 1994 by India. This unit is to provide the information relating to the significance of biodiversity and also on the relevance of this Act to socio-economic and cultural life of Tribals.

2. Learning Objectives

After going through this unit the reader is expected to:

- 1) Understand the concept of biodiversity;
- 2) Acknowledge the salient features of Biodiversity Act 2002;
- 3) Monitoring of biodiversity;
- 4) Functions and regulatory mechanisms and associated issues; and
- 5) Acknowledge the importance of Biodiversity in tribal livelihoods.

3. What is Biological Diversity?

Biological diversity means variability in all aspects of life forms. This variability is at the genetic level and also at the species level in various ecosystems providing ecological balance. Biological diversity means “the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems” (Convention on Biological Diversity 1992). Biodiversity not only refers to species richness or variety but also the differences in genetic markers of the population.

The extent of biodiversity determines the goods and services provided from the ecosystem. Fall in biodiversity rates directly has bearing on decomposition rates, vegetation biomass production and, in the marine environment, affect fish stocks. Realizing the importance of biodiversity for the benefit of the human kind, the Convention on Biological Diversity (CBD) was conceived in 1992 and consists of 193 member countries. The CBD calls for general awareness of the conservation of biodiversity as it will enhance social and economic progress. Another pressing issue that was brought upfront by the convention was bio-piracy where bio-reserves and indigenous knowledge were misused and not given their due credit.

The CBD thus provides the guidelines for conservation of biodiversity and has three main goals:

1. The conservation of biological diversity;
2. The sustainable use of the components of biological diversity;

3. The fair and equitable sharing of the benefits arising from the use of genetic resources.

4. Biological Diversity Act 2002

The Government of India ratified the CBD in 1994. After incorporating suggestions, deletions etc., to suit the Indian context, a legislation concerning biodiversity was passed in the form of the Biological Diversity Act 2002. The Act is for preserving biodiversity in India and provides a mechanism for sharing equitable benefits that are an outcome of traditional or indigenous knowledge or expertise. The Act defines biodiversity as “the variability among living organisms from all sources and the ecological complexes of which they are part, and includes diversity within species or between species and of eco-systems”. The Act also defines, biological resources as “plants, animals and micro-organisms or parts thereof, their genetic material and by-products (excluding value added products) with actual or potential use or value, but does not include human genetic material” (Biological Diversity Act 2002).

For the successful implementation of the Biodiversity Act, the National Biodiversity Authority (NBA) an apex government body was set up as an autonomous regulatory body with its headquarters in Chennai. The NBA functions under the Ministry of Environments and Forests and is responsible for the implementation of Access and Benefit Sharing (ABS) mechanism. The NBA has fifteen members with two ex officio members from the Ministry of Environment and Forests and also consists of expert committees who process ABS applications on regular basis. The Biodiversity Act applies in addition to forest and wildlife laws and is geographically applicable throughout India. The delineated objectives of the Act such as conservation, sustainable use and equitable benefit sharing are most significant for forest ecosystems and the people who derive their livelihoods from these ecosystems. To operationalize the Act, Biodiversity rules, 2004, and ABS guidelines, 2014 were notified by the Government of India.

5. Salient Features of the Act

- Prohibition on transfer of Indian genetic material outside the country, without specific approval of the National Biodiversity Authority (NBA).
- Prohibition on anyone claiming an Intellectual Property Right, such as patent over biodiversity or related knowledge without obtaining prior permission of NBA.
- Regulation of collection and use of biodiversity for commercial use by Indian nationals, while exempting locals for local use from such restrictions.
- Measures for sharing of benefits from the use of biodiversity including transfer of technology, monetary returns, joint R&D, joint IPR ownership etc.
- Measures to conserve and sustainably use biological resources including habitat and species protection, environmental impact assessments of projects, integration of biodiversity into the plans, programmes and policies of various departments/sectors.
- To work towards conservation of biological diversity.

- Provisions for local communities to have a say in the use of their resources and knowledge and to charge a fees for this through State Biodiversity Boards.
- Protection of indigenous or traditional knowledge through measures such as documentation, registration etc., in the form of peoples Biodiversity Registers.
- To conserve and safeguard places with high biodiversity levels by declaring them as biodiversity heritage sites.
- To facilitate active involvement of state governments (State Biodiversity Boards -SBB) and other special committees (Biodiversity Management Committees-BMCs) in the effective implementation of the Act.

6. Regulatory Mechanism

The Act prohibits any person from obtaining any biological resource or associated knowledge with any biological resource from India without the prior permission of the NBA for research or any commercial activity. This rule applies to foreigners, NRI's, corporate companies not registered in India. Any particular or general results or findings of research pertaining to biological reserves cannot be transferred to other persons or organizations without obtaining the prior the permission of the NBA. However, the above rules do not apply if the research is carried out as collaborative projects. In the case of obtaining Intellectual property rights also, prior approval of NBA is compulsory. Similarly, prior intimation must be given to State Biodiversity Boards if a person or organization needs to study or use biological reserves occurring in State geographical area. Again, these regulations do not apply to the local people or communities who may be growers, cultivators or practitioners of traditional medicine.

7. Functions of the Governing Bodies

National Biodiversity Authority (NBA): Being apex regulatory governing body is vested with the responsibility of regulating activities involving biological resources or traditional knowledge and must regulate access to biological resources and ensure equitable benefit sharing. It may grant or oppose any research or commercial activities or grant of IPR to any individual or organizations involving biological reserves or knowledge reserves occurring in India. The NBA also guides the State Biodiversity Boards in appointing the members, managing and sanctioning grants in aid, compiling and composing technical data, codes, and manuals for conservation of biodiversity.

State Biodiversity Boards (SBBs): These are constituted as regulatory bodies by respective state governments and the NBA shall oversee the union territories directly or may constitute a body at its discretion. The functions of these boards are mainly to advice the state governments in matters or activities related to biodiversity. Processing of requests for bio-surveys or utilization of biological resources and taking them to the notice of the NBA.

Biodiversity Management Committees (BMCs): A number of such committees function at local levels (local bodies like Panchayaths and Municipal bodies) for promotion of the idea of conservation of biodiversity. They maintain records of species level diversity and also knowledge database of the particular area in which they function. Therefore, the NBA

and SBB's consult the BMC's while formulating decisions relating to granting permission to individuals or organizations utilizing bioreserves.

8. Issues in Regulatory Mechanism

The Biodiversity Act is an operative legislation concerning biodiversity governance in the country; however, it suffers from some ambiguities even today. These ambiguities are mainly with respect to what is regulated and who are to share the benefits under the Act. The provisions in the Act have not been correctly interpreted on parameters of both access to biological resources and on benefit sharing regulations. The holders of indigenous knowledge are the actual custodians of biological resources and their livelihood depends upon these resources. The SBB and the BMC's must establish relationship with local communities. The NBA has been striving hard to remove ambiguities and streamline the process of implementation of BD Act, 2002. In this regard the NBA has brought out access benefit-sharing guidelines in November, 2014.

Kani Tribe and the 'arogyapacha' plant – Benefit sharing model

Kani tribe is located in Kerala and possess knowledge of a particular plant, known locally as "arogyapacha (scientific name *Trichopus zeylanicus*) which has certain unique anti-fatigue/anti-stress properties. Indian scientists working in TBGRI research centre learnt about this plant from Kani tribe who shared with them the identification of plant and its traditional use. After 8 years of research on the plant, scientists managed to isolate twelve active chemical compounds with far ranging properties which included 'anti-stress and immune- stimulating properties' and 'also boosts stamina, relieves fatigue, helps control tumors and activates the body's natural defenses and cellular immune system. TBGRI (scientists) used these extracts to create a herbalised formulation which could be marketed as Jeevani and also filed a patent application for the same. TBGRI entered into a licensing agreement with an Indian herbal pharmaceutical company for marketing the final product. Fifty families from Kani Tribe were given approximately US\$ 40 each for cultivating the plant - five tons of the leaves per month bought by TBGRI for the production of Jeevani. TBGRI also incorporated a trust consisting of representatives within the tribe which would give the tribe a share of the revenues earned through the sale of the formulation Kani people received first payment of US\$ 12,500 from the benefit sharing agreement. Funds from the Trust are earmarked to be used for a variety of projects: e.g. installing a telephone booth; creating an insurance scheme that would provide financial help for pregnant women.

(Source: Case Studies on IPRS, Biodiversity, Consent and Benefit Sharing – Professor Uma Suthersanen)

9. Summary

Biological diversity refers to the overall variability of life forms at both species level and genetic level. The importance of conserving biodiversity was conceived at the Convention on Biological Diversity in 1992 with over 193 members. The Indian legislation on biological diversity conservation was passed in 2002 although India joined the CBD in 1994. The Biodiversity Act is applicable in addition to extant forest and wildlife laws and is geographically applicable throughout India. The most important feature of the Act is with respect to access and benefit sharing of biological resources occurring in India including

traditional knowledge resources. For the purpose of monitoring the regulatory mechanisms, the National Biodiversity Authority was set up. The Act prohibits any person from obtaining any biological resource or knowledge capital associated with any biological resource from India without the prior permission of the NBA for research by non-Indians or any commercial activity by any individual or entity. The NBA is supported by State Biodiversity Boards and Biodiversity Management Committees at the state and local levels respectively. The Act suffers from certain ambiguities with respect to what is regulated and who are to share the benefits. Most of the ambiguities have been removed by notifying Access and Benefit sharing guidelines by Government of India in November 2014. Some of the biodiversity measuring parameters include species richness, population number, genetic diversity, endemism and phenotypic variance.

10. Recapitulation

- What is Biological diversity? What are the main goals of CBD?
- What are the most significant features of Biodiversity Act 2002?
- What is the role of the governing bodies like NBA, SBB's and BMC's in regard to Biodiversity Act 2002?
- What are the important problems in regulatory mechanism?
- What are options available to facilitate benefits to locals from use of biological resources by traders, pharmaceutical, cosmetic industries & seed companies etc?

11. Key Terms

Species, biodiversity, Access and benefit sharing, conservation, government.

12. Activity

- Discuss with NGO functionaries on innovative ideas for enhancing awareness about biodiversity conservation in village level institutions.
- Discuss the indigenous knowledge and institutions relating to conservations of biodiversity in tribal areas. For more information NBA website www.nba.org may be referred.

13. References

- Joan, Alphonsa. 2017. The Curious Case of the Indian Biological Diversity Act, *The Wire*
- Joshi, Namita and P.C. Joshi. 2009. *Biodiversity and Conservation*. New Delhi: APH Publishing Corporation.
- Myers, N. 1990. The Biodiversity Challenge, Expanded Hotspots Analysis. *Environmentalist* 10, 243–256.
- National Biodiversity Authority. 2014. *The Biological Diversity Act, 2002 and Biological Diversity Rules, 2004*(2004), ABS Guidelines.

CONTENTS IN OTHER VOLUMES OF THE SOURCE BOOK

Volume-1

General Themes

Contents

- Indian Society: Indigenous Populations, Scheduled Tribes and Scheduled Castes / *Mariakumar Mathangi*
- Tribes in Andhra Pradesh: Diversity and Social Organisation / *Narayana Rao Bonthu*
- Building Empathetic Interactions with Tribals / *Anakha Ajith*
- Contemporary Tribal Challenges / *Dalibandhu Pukkalla*
- Approaches to Tribal Policy and Tribal Development / *Thanuja Mummidi*
- Constitutional Framework, Human Rights and Child Rights / *Sama Arun Kumar Reddy*
- Role of Traditional Leadership and Tribal Institutions in Developmental Process / *Anil Kumar.K*
- Gender Sensitivity in Tribal Administration / *Bhavapriya Thottakad*

Volume-2

Land and Identity Issues in Tribal Areas

Contents

- Tribal Areas: Pre and Post-Independence / *K. Koteswara Rao*
- Verifying Tribal Characteristics and Claims of Cultural Affinity for Scheduled Tribe Status / *K.V. Subba Reddy*
- Community Resources and Management in Tribal Areas / *Alok Pandey*
- Land Ownership, Conflicts and Dispute Resolution in Tribal Communities / *Alok Pandey*
- Land Acquisition in Tribal Areas and Acts of Land Acquisition / *K. Koteswara Rao*
- Resettlement and Rehabilitation Policy and its Implementation / *K. Koteswara Rao*

Volume-3

Tourism, Culture, Youth Welfare and Entrepreneurship Development

Contents

- Expressive Cultures among Tribals: Issues of Tribal Identity and Tribal Rights over Cultural Expression / *Snigdha Vishnoi*
- Tribal Tourism and Tourism for Tribal Development / *P.D.Satya Pal*
- Opportunities for Promotion of Tribal Sports, Arts and Crafts / *Amit Kumar Kisku*
- Livelihood Diversification through Non-Agricultural Sectors : Opportunities and Challenges for Skill Development / *Sabari Girisan M*

Volume-4

Health and Women and Child Welfare

Contents

- Health Status of Tribals : An Overview of Disease Burden in Tribal Areas / *Anitha C T*
- Malnutrition in Tribal Areas and Government Programmes of Nutrition / *Anitha C T*
- Immunization Status of Tribals / *Anitha C T*
- Healthcare Schemes of Government in Tribal Areas / *Dalibandhu Pukkalla*
- Cultural Context of Health and Illness / *Anakha Ajith*
- Health and Magico - Religious Practices of Tribes / *Deepika Siripurapu*
- Understanding the Strengths of Tribal Health Practices / *Shalini Shaji*
- Reflecting on Narratives of Illness : The Case Studies of HIV/AIDS and Ebola / *Zenia Taluja*

Volume-5

Panchayat Raj and Development

Contents

- Bottom-Up Approach in Planning and Needs Assessment / *Sama Arun Kumar Reddy*
- Innovations for Tribal Development: Types, Challenges and Lessons Learnt / *Avik Chakraborty, Choragudi NV Ashish, and Narayana Rao Bonthu*
- Tribal Sub Plan 1975-2013 and Special Development Fund / *Kalyan Reddy Pendli*
- Needs and Challenges of Inter-Sectoral Coordination of Welfare Activities / *Kalyan Reddy Pendli*
- PESA (Panchayats Extension to Scheduled V Areas) Act and Its Implementation / *Annamalai V*

Volume-6

Interface of Law and Customary Law

Contents

- Customary Mode of Conflict Resolution in Tribal Areas: A New Task on Our Agenda / *Rakshith BV*
- Issues Relating to Denotified and Nomadic Tribes of Andhra Pradesh / *Gandhi Malli*
- Implementation of PCR Acts and Crime and Atrocities on Women in Tribal Societies / *Ravi Kumar Mala*

Volume-8

Agriculture and Challenges of Marketing

Contents

- Promotion of Agriculture in Tribal Areas / *Bhallamudi Sridhar and Mrinal Kanti De*
- Tribal Livelihood Promotion through Development of Allied Sectors to Agriculture / *Bhallamudi Sridhar, Mrinal Kanti De and RS Reddy /*
- Afforestation / *Sravanthi P*
- Marketing of Agricultural Produce and Non Timber Forest Products: Challenges and Opportunities for Tribals / *Shilpi Harish*

Volume-9

Formal Education

Contents

- TW Educational Institutions: A Situation Analysis / *Vadrevu Ch. Veerabhadru*
- Problems of Tribal Education: An Overview / *Sujatha K*
- Tribal Education in India: A Review of Policies / *Sujatha K*
- Gurukulams as Residential Schools: Equity and Excellence in Educating Scheduled Tribes in India / *Sujatha K*
- Involving the Community in School Management / *Surya Surendran*
- Gender Sensitization in Schools / *Snigdha Vishnoi*
- Facilitating Tribal Students for Higher Education / *Sabari Girisan M*
- Innovations and Future Prospects in Tribal Education / *Sujatha K*
- Tribal Education, Challenges, Innovations and Suggested Interventions / *CIPS Team*

Source Book for Functionaries in Tribal Areas Volume 7 : Natural Resource Management and Biodiversity

As part of the MoU between CIPS and the Tribal Welfare Department, Government of Andhra Pradesh, Amaravati, CIPS has been requested to design a module for the functionaries working in the tribal areas of Andhra Pradesh. CIPS has collaborated with the Department of Anthropology, University of Hyderabad and brought out these modules.

The modules are designed as source books explaining the key concepts, information and reference material pertaining to important aspects of tribal life, culture, economy and various programmes taken up for their development and welfare. Each source book is expected to help the functionaries as self-learning material, equipping the functionaries with the basic concepts, theoretical framework and practical application of the principles concerning various aspects of governance in the tribal areas and of tribal development.

Prof. B.V. Sharma and Prof. N. Sudhakar Rao of Department of Anthropology, University of Hyderabad have edited this volume, assisted by Dr. K. Koteswara Rao, Post-Doctoral Fellow at the Department, under the overall guidance of Sri C. Achalender Reddy, Director, CIPS and his team.

