microbes, plants, animals and birds on the campus as integral components of its ecosystem.

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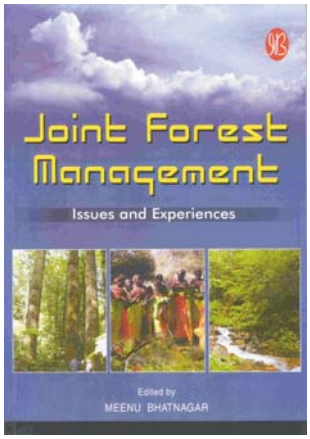

Joint Forest Management: Issues and Experiences. Meenu Bhatnagar (ed.). The Icfai University Press, 52, Nagarjuna Hills, Punjagutta, Hyderabad 500 082. 2008. 209 pp. Price: US$ 16.

Sustainable natural resource management has often been a great challenge for planners, decision-makers and resource managers in the context of economy-driven development paths, and consequent erosion of resources. During the pre-colonial period, the forests were controlled and managed by village communities resulting in a common property regime with no private claims by individuals, and the forests were accessible to all community members according to their needs[1,2].

The Forest Act 1828, followed by the Forest Act 1928, helped to bring the best forestlands throughout the country under the State control as 'reserve forests', and these areas were made inaccessible to local people. A National Forest Policy was formulated in 1894 to guide technical management of forests rather than ecosystem-based approaches in the management. When the National Forest Policy came into existence in 1952, use of forests by adjoining village communities was relatively restricted at the cost of national interests. Managing the forests by giving importance only to larger national interests and overlooking the people's needs resulted in forest degradation, which further led to ineffective protection of forests by the Forest Department. The twin processes of decline in customary resource management regimes and the acquisitive tendencies of the State, have resulted in higher rates of deforestation and unregulated, with unsustainable use of forest produce. This necessitated active participation of local communities in forest conservation, resulting in a paradigm shift in natural resources management in the late eighties. This conservation approach also focused on decentralized level of governance with participation of the local communities through the Joint Forest Management System by linking socio-economic incentives and forest development, which further harbingered effective and meaningful involvement of local communities. Thus, India has been at the forefront in the global arena of devolving natural resources management to the local community level, particularly in the forestry sector, for more than a decade.

The Indian Forest Policy of 1988 was an important breakthrough in the protection of forests because it mainly recognized the importance of local people's involvement in forest management for achieving the improvement in community livelihood and protection of forest resources. The concept of livelihood integrates the ecological, economic and social well-being of people. The livelihood framework identifies five core, interlinked asset/capitals, viz. physical, financial, social, natural and human capital. In a follow-up document issued in 1990, the Central Government issued guidelines to all State Governments to implement 'Joint Forest Management Systems' by transferring everyday forest use and management rights to the community[3,4]. The policy laid stress on environmental protection, conservation and 'meeting the requirements of fuel-wood, fodder, minor forest produce and small timber of the rural and tribal populations' and 'creating a massive people's movement with the involvement of women for achieving these objectives' (GOI, 1988). The 1988 Forest Policy of India[5], articulated the twin objectives of ecological stability and social justice. In order to translate the participatory policy objectives into practice, the Ministry of Environment and Forests, Govt of India on 1 June 1990 issued a circular to Forest Secretaries of all States and Union Territories providing guidelines[6] for the 'involvement of village communities and voluntary agencies in the regeneration of degraded forests'. The policy document asserts that local communities should be motivated to identify themselves with the development and protection of the forests from which they derive benefits. Thus, the policy envisages a process of joint management of forests by the State Governments (which have nominal responsibility) and the local people, to share both the responsibility for managing the resources and the benefits that accrue from this management. This led to the adoption of Joint Forest Management (JFM) by several State Departments. Thus, JFM evolved from the conflicts that arose over local use rights, for subsistence, commercial use and preservation of environment and ecology. The major landmarks during the post colonial period are: The Zamindari Abolition Act, 1952; National Commission on Agriculture, 1976; Forest Conservation Act, 1980, and the subsequent National Forest Policy, 1988. The various initiatives have led to greater access and control of forest resources by local people, in turn resulting in the improvement in forest protection and management, and reducing pressure on resources. There has been a nationwide implementation of JFM since 1990, covering more than 17.33 mha of forest area being managed through more than 84,000 village forest protection and management committee (VFPMC) groups. The JFM approach is based on mutual trust, defined roles and responsibilities to attain sustainable forest production and regeneration in keeping with the needs and aspirations of all stakeholders. The focus is on empowering locals with livelihood options through local, people-friendly forest strategy.

This book consists of two sections with a total of fifteen articles. The first section addresses potential, challenges, multi-sectoral approaches, policies, etc. The second section dwells on the experiences in the implementation of JFM. The book also covers the discussion on JFM's relevance, challenges, performance, emerging practices and state experiences.

The first chapter by Bhatnagar focuses on the concept, strategies, potential and benefit-sharing in JFM, while addressing the issues involved in it. The role of

institutions, communities and NGOs in organizing and implementing JFM has been discussed across different states. The article emphasizes the need for immediate attention on issues like illegal felling, grazing, forest fires and encroachments, apart from the aspects of enhancing productivity, regeneration, gender, equity, sharing of benefits, etc. to ensure the success in JFM programmes. In the second chapter, Pathan examines the scope of linkages of private–public partnerships, while discussing the concept of sustainable forest management and scope for technological innovations. Based on the JFM experiences in Gujarat, the chapter highlights the enormous scope of medicinal plants, non-timber forest products-based private sector, tourism and cottage industries for strong linkages with the public sector for mutual benefits through lateral economy to improve returns to the local communities.

In the next chapter, Upadhyay analyses three national forest policies of the post-independence era (1952, 1984 and 1998) to ascertain the concept of ownership for implementation of JFM. The analysis shows that community-oriented forest management approach aided in the sustainable management of forests. All the three forest policies, by adopting the principle of doctrine of public trust for the management of resources, retain the forest under the trusteeship of the Government. The Scheduled Tribes and other Traditional Dwellers Act, 2006, is contrary to the principle of doctrine of public trust and its implementation would further fragment and degrade the forest resources apart from posing serious threat to ecological security of the nation.

According to Rao and Kerr, the community-based resource governance is increasingly being recognized as an ability of the local communities in collaborative management of natural resources. Their article also explores opportunities for revitalizing JFM through compensating forest fringe communities for providing environmental services. Hobley examines the implication of benefit accruing to people and institutional responses with ecological changes. A new set of relationship between the forest department and people living in and around forests and woodlands exists due to JFM. The presumption that forest management and associated problems were technical in nature and could be resolved through technical solutions is being successfully challenged. The last article of the first section, by Sowmya *et al*., argues that community forestry is a better approach, while elucidating the drawbacks of JFM – the present policy fails to issue long-term stakes and rights to the communities in the improvement of forests. Those who cleared forests got titles of land giving them legal status, while those who let forests stand got cleared squatters.

Ahwasti: a success story of JFM, in the second section by Goswami highlights the role of local communities in protecting and restoring forests in Maharashtra and emphasizes the role of the JFM in ecological security, which is key to socio-economic uplift of the local people. JFM is an evolving policy-based programme and sets out to establish management 'partnerships' between local forest-dependent communities and the state for sustainable management and joint benefit sharing of public land. Kaushal and Kala present the role of microfinance as a component of JFM in the development of villages and in reducing people's dependence on forests for non-timber products and other benefits. Abraham and Kiran review criterion-based assessment of the community-developed carbon sinks in villages of Narmada District, Gujarat. The study suggests empowering the tribal and rural community as JFM relies on low-cost options for regeneration of degraded forest patches. Ensuring community participation leads to sustainable livelihood development by linking ecological and social processes. The next chapter by Kaushal provides an account of the concept, working and effectiveness of the Village Forest Councils (VFCs). The study highlights that VFCs are successful in addressing poverty alleviation, promoting opportunity, facilitating empowerment and enhancing security.

Gupta discusses emerging conflicts over forest protection among the user groups and between villages along with the setting up of a conflict-resolution mechanism. The crux of the conflict is the approach of the government to guard natural forest resources, inappropriate use to check exploitation while village communities indulge in activities which are detrimental to the sustenance of forests. Jain analyses the experience of implementation of participatory reforestation programmes, with particular reference to the progress of community institutions towards sustainable management of regenerating forest resources. Responsibility for protection and use of regulation has been taken over by communities in Rajasthan since 1991, while the government provides technical guidance and investment support.

Dasgupta and Roy analyse the problems and difficulties faced by the women and also highlight the gender upsurge in a post-JFM scenario through a series of technological experiments, training and sensitization. Lack of information, attitude of Forest Department staff, irrelevance of women's views, etc., were cited as factors affecting the active participation of local women. The authors also threw light on the Participatory Forest Management (PFM) endeavour at IIT, Kharagpur. The entrepreneurial quality of women due to PFM has a direct bearing on their changing role in JFM on account of economic and social security, which is being reflected in household and forest-related matters. Griffiths lists the efforts and interventions of World Bank projects on JFM and community forest management project in Andhra Pradesh and also discusses the impact of these interventions on the adivasis, in the penultimate chapter. The author emphasizes the need for re-orientation of the forest policy and administrative system for decentralization of governance.

In a nutshell, this book addresses the processes and circumstances that led to the evolution of JFM in India, as well as the forest polices that facilitated this change. It reviews and analyses the emerging policy issues confronting JFM. Implementation and expansion of JFM throughout the country has raised several issues, such as equity in participation and benefit sharing, institutional impediments that are responsible for the high transaction costs and availability of institutional finance for JFM. The book also provides insights to JFM, required for better implementation and success of the programme. We are slightly disappointed to see a distorted map of India (p. 6). The book would be useful for scholars, researchers, policy-makers, decision-makers, non-governmental agencies, and the general readers interested in the conservation and regeneration of India's forest wealth.

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Chromatin and Disease: Subcellular Biochemistry. Tapas Kundu and Dipak Dasgupta (eds). Springer. 2007. 458 pp. Vol. 41.

Genomic DNA in eukaryotic cells is compressed and packaged with histone and non-histone proteins. This compressed state is often inaccessible for transcription and opening up of these structures is required before transcription can occur. Thus, change of chromatin structure is a crucial step in the regulation of gene expression. There are many players in the regulation game and most act through post-translational modifications of histones and chromatin associated non-histone proteins. It is natural that malfunction of such a highly important central process in the biology of the cell will lead to a diseased state. However, the role of chromatin modifications in many disease processes is only beginning to be understood.

During embryonic development in humans, a totipotent single cell differentiates into more than 200 types of functionally specialized cells. This differentiation programme can be regarded as the one establishing many types of genomic packaging leading to the corresponding epigenome defined by a unique set and level of expressed genes and features of the chromatin across the genome. Once the cell type-specific expression state is established, its maintenance – referred to as the epigenetic cellular memory, is also critical for the appropriate functioning of the cell throughout the life of any organism. Two groups of genes, *Polycomb* group (*PcG*) and *trithorax* group (*trxG*), maintain the active and repressed expression state. Mechanisms of maintenance of expression state involve recognition of the expression state of chromatin by the *PcG*/*trxG* members, appropriate epigenetic modification of the associated histones and, finally, recruitment of a number of other factors that recognize such a mark to maintain the expression state[1]. For example, *Polycomb* repressive complex 2 (PRC2) interprets the repressed state and puts the H3K27Me3 mark, which is recognized by the chromodomain of *Polycomb*, a core member of the PRC1 complex. Active state modification is H3K9Ac that is recognized by bromodomain of *Brahma*, a member of the trxG complex that maintains the active state. Since *PcG* and *trxG* genes maintain the expression state of chromatin, it is obvious that malfunction of this class of proteins could contribute to disease conditions. Weakening of this epigenetic cellular memory may cause mis-regulation of a number of genes – a situation similar to that of aging and diseases like cancer, where a large degree of mis-regulation of genes takes place. While a number of examples are known where *PcG*/*trxG* genes have been found to be linked to a disease like cancer[2], a linkage of changes in the epigenetic state of genome packaging caused by the alteration of activity/expression state of PcG/trxG proteins to the process of aging is beginning to emerge.

A number of studies point to a major role of PcG and trxG proteins in cancer. The mixed lineage leukaemia gene, *MLL1*, was found to be associated with 11q23 translocations that are linked to a variety of haematopoietic malignancies. *MLL1* (also known as *HRX* or *ALL1*) is human homologue of the *trithorax* (*trx*) gene of *Drosophila*. This finding established direct connection between cancer and a trxG protein involved in the maintenance of active chromatin state[3]. Involvement of *PcG* genes in cancer has also been established in a number of cases. For example, over-expression of BMI-1 and EZH2 has been linked to breast and prostate cancers[4]. BMI-1 is over-expressed in several other cases – non–small-cell lung cancer, colorectal cancer, nasopharyngeal carcinoma, and oral cancer[5].

One of the early studies that linked chromatin to disease was on Retinoblastoma protein (Rb), a tumour suppressor that controls gene expression by modulating chromatin architecture. One of the major mechanisms of Rb action is through the recruitment of histone deacetylase HDAC1 and bringing it to the E2F bound to promoters of cell-cycle progression genes, including cyclin E. This explains why many cancer cells have to work their way past the Rb protein. The repression brought about by these interactions is released by oncoproteins or mutations in Rb. Viral oncogenes have been shown to bind to Rb and hence, release it form the HDAC1–Rb–E2F complex, which allows transcription to occur from the E2F-bound promoters[6].

Since the discovery of the role of Rb action in cancer development, many other signalling pathways that play a role in tumourigenesis have been discovered. Many of these pathways regulate gene expression through modification of the chromatin and are dysregulated in cancer[7]. One of the most important transcription factors which is at the heart of tumour development that regulates gene expression through recruitment of chromatin modifying complexes, is p53. This transcription factor controls many regulatory pathways that regulate cell division. A large number of genes are either activated or repressed by p53, mostly through binding in the upstream region and recruitment of histone-modifying complexes. The protein itself is mutated and inactivated in 50% of the cancers and its associated proteins are inactivated in the rest. The intimate role of tumour development and signalling pathways that regulate cell proliferation and apoptosis through chromatin modification, has been known for last several years. It was mostly seen as a consequence of mutations that happen during tumour development to escape from the regulation of growth under normal conditions. Recent studies have revealed extensive changes