Forest Management in a changing climate.

R.P. Sharma,
Principal Chief Conservator of Forests, *Kerala Forest Department*
&
Bransdon S. Corrie
Chief Conservator of Forests, *Kerala Forest Department*
email: bscorrie@yahoo.com

Introduction:

As the world grapples to address the threats of climate change focus is increasingly shifting to forests, considering the four important roles forests play in relation to climate change:

(i) they contribute towards global carbon emissions when cleared, overused or degraded;

(ii) they react sensitively to a changing climate;

(iii) they produce woodfuels as a benign alternative to fossil fuels; and finally,

(iv) they have the potential to absorb global carbon emissions into their biomass and store them - in principle in perpetuity.[1]

Upgrading forest management practices is therefore a good strategy for addressing climate change challenges. This paper presents a model for forest management in this changing climate.

Each year large tracts of forest land lose out to the pressures of development. Each year forest fires devour large tracts of land many of which go unreported. Each day forest dependant communities graze cattle, remove firewood, timber, and other non-timber forests products and poach wildlife from our forests to meet livelihood needs most of which goes unrecorded. Unfortunately such removals are not covered by sustainable work plans. The

rapidly rising population, the growing disparity between rich and poor and the dwindling resource base has further increased the pressures on forests and add fuel to the fire of global warming. Declining tiger numbers are a manifestation of the pressures exerted and point to required changes in policy and practices. The enactment of The Scheduled Tribes and other traditional forest dwellers (Recognition of Forest Rights) Act 2006 makes it imperative to have sound systems and plans for harvesting non timber forest produce if we are to have sustainable ecosystems. At a time when the world is seized of the perils of global warming- an opportunity exists for forest managers to take stock and initiate corrective measures to manage forests effectively in this climate of change.

The term forest management comprises two words. To provide clarity as to the meaning and applicability of the term forest management it is appropriate to first define these two words.

A forest can be defined as, 'an ecosystem or an assemblage of ecosystems dominated by natural vegetation; comprising all living organisms and non-living things and includes the environment in which the ecosystem exists'. The living parts of a forest include the flora (trees, shrubs, vines, grasses and other herbaceous (non-woody) plants, mosses, algae, fungi); and the fauna (insects, mammals, birds, reptiles, amphibians, and microorganisms living on the plants and animals and in the soil). The non-living parts include- the soil, water, and minerals. The living and the non-living interact with each other and with the environment in which the ecosystem(s) exist.[2]

Management is the process of getting activities completed efficiently and effectively with and through other people. [3] Management is both art and science. It is the art of making people more effective than they would have been without you. The science is in how you do that. Management has four basic pillars: plan, organize, direct, and monitor.[4]

The manager performs the following roles:

- Interpersonal roles: Figurehead, Leader, Liaison
- Informational roles: Monitor, Disseminator, Spokesperson
- Decisional roles: Entrepreneur, Disturbance handler, Resource allocator, Negotiator

From the above definitions it can be seen that the two words have been used in a largely restricted sense in forestry practice. The term forests have been watered down over the years. Historically, in India forest managers focused on timber and raising of plantations. This resulted in the erroneous limited focus of forest managers to the trees in a given area. The enactment of the Wildlife (Protection) Act 1972 and the ad-hoc carving out of a separate wildlife wing with separate areas - the protected areas-resulted in a further limiting the focus of forest managers. As a result forest managers missed the woods for the trees.

Forest management in India is more about plantation forestry and less about the science of ecosystem management and the application of managerial principles in forestry practice. This needs to be immediately addressed.

Evidently to take forest management practice in India to a new level six fundamental changes would be required:

(i) The term forest must be understood in its broadest sense to include the flora and the fauna. To avoid ambiguity the term forests and wildlife is best dispensed with.

(ii) Forests must be managed as an ecosystem (with necessary protocols) for ecosystem goods and services and not with a limited focus on timber or on wildlife,

(iii) Forest managers and more so protected area managers must engage in fundamental wildlife management practices- conduct of inventory, and regular monitoring and management of habitat and species.

(iv) Protection must be the prime area of focus,

(v) Immediate need to integrate managerial principles in forest management practice, and

(vi) Systems and protocols must be codified and institutionalized so that change does not evaporate immediately after its introduction or with the transfer of personnel.

Methodology:

This paper draws from:

(i) the initiatives introduced by the second author during his tenure as Chief Conservator of Forests (Wildlife) during the period 2003-04,[5,6]

(ii) an experiential learning opportunity with practitioners and researchers in the US, and

(iii) an integrated model for forest management developed during a Fulbright Program that draws heavily from managerial principles.[7]

Although protected areas were set apart for wildlife and were covered with Management Plans (as opposed to Working Plans) wildlife management in the field failed to take off. Preparation of inventory, monitoring and management of habitat and species fundamental to wildlife management failed to form part of management practice. Not surprisingly tigers vanished from Sariska without any alarm bells ringing. It was the first time in Kerala that an attempt was made by the second author to document habitat and species and it was the first time in the country that a system of auditing of sanctuaries was conducted,[8] even before the Prime Minister called for such auditing following the Sariska fiasco. These initiatives must be built upon.

In the US there are several agencies managing forests. At the Federal level there is the US Forest Service, the US Fish and Wildlife Service, the National Park Service. At the State level there is the Department of Natural Resources. Then there are the county forests. Apart from this large tracts of forests are under private control. The management practices of all these agencies follow well established systems and protocols. The model presented has been drawn from these initiatives.[9.10.11]

When we look at the history of forest management in US and India we find that both countries have had common origins. Both owe their ancestry to German forestry. In India it was German forester Dietrich Brandis and in the US it was Gifford Pinchot trained in Germany and mentored by Brandis. But it is here where the similarity begins and ends. While India focused on managing forests for meeting the timber requirements, in the US Forests were managed for both the timber and the services that they provided. It was the leadership and vision of President Theodore Roosevelt who realized the important ecosystem service provided by forests- making water available to an ecosystem that resulted in vast tracts of deforested barren land being brought under tree cover.[12] As a result of this initial head start US is years ahead in forestry. Its management practices have been keeping abreast of the times and today the focus is on management for ecosystems services.

Indian forest professionals can learn many important lessons from the North American model of wildlife conservation. In this model hunting is allowed but trade restricted. The huge hunting lobby drives scientific management of wildlife as a result there is hunting and there is conservation. Though this may sound paradoxical the results speak for themselves- wildlife has been increasing over the years! If an analysis of wild animal populations is made from the 1920's we see that despite hunting there is a steep increase of wildlife over the years.[13] This is difficult to comprehend for in India although hunting is banned the wildlife has been steadily decreasing over the years. While hunting is not advocated what is advocated is strengthening the protection network and placing sound systems of monitoring of habitat and species.

Tiger poaching figures gives a face to protection problems managers face. Post Sariska about 110 tigers have been reportedly killed in India. The unreported figures could be 10 times this.[14] To add to this tiger habitat is becoming increasing fragmented and degraded.[15] With the worlds tiger population estimated at below 4000 this is far from gladdening news for the tiger. With India home to about 40 percent of the world's tigers upgrading forest management practices could herald a new beginning for the tiger. This would mean better managed forests in a changing climate. Fortunately success is dependant on forest service professionals rising to the occasion.In the US there is a huge non-governmental presence. Many of these agencies are conservation based. The research outputs of these agencies in so far as it relates to forestry practice have been studied and incorporated in the model.[16]

Facilitated by a team of managerial experts from the College of Business and Organizational leadership and drawing from their expertise in strategic planning, organizational leadership and innovation a model for forest management was developed using the PRISM approach.[17] A workshop comprising practitioners, researchers and management experts was conducted to peg the challenges and map the

road ahead. The results of this workshop were discussed amongst researchers at six Universities- Concordia, Minnesota, Cornell, Duke, South Carolina and Clemson and their inputs incorporated. An operational model was presented at the World Bank's Global Tiger Initiative. The model presented is based on this exercise.

The workshop identified three major challenges facing forest managers are:

(i) **The science challenge**: Integrating the advances in science and enabling managers to see the big picture- view both the woods and the trees.

(ii) **The technology challenge**: Integrating advances in technology. How to best leverage technology to ensure flow of information and improve decision-making?

(iii) **The management challenge**: Integrating managerial principles. How to best leverage management to improve functioning and to ensure sustainability? The forest staff is second to none but performance does not match the potential. How to win support of stakeholders?

The model:

The model proposes a paradigm shift in forest management with focus on the forest beat so that protection is given the prime attention that it deserves supported with good planning and scientific systems and procedures. The model is built on four sturdy pillars: Integration, sustainability, adaptability and collaborations. The salient features of the model are:

(i) it integrates the best of science, technology and managerial principles.

(ii) It is inclusive as stakeholders are party to management, and

(iii) It follows adaptive management approach[18] as provision exists for making appropriate changes during the implementation process so that objectives are met.

Constructing the model:

(i) Energizing the work place: First, the work place must be vibrant with energy. To do this an enabling environment must be provided which are possible using managerial principles. In the US across all agencies there is a striking vibrancy in the work place and personnel exhibit great pride in their work and are highly enthusiastic about their job. It is this spark that is absent among forestry professionals in India. If we wish to manage forest effectively and efficiently in a changing climate then the first step to be taken is to kindle this spark. This means upholding a set of desired values, facilitating good organizational culture, developing fair systems for employees in matters of career advancement, placement and performance management. Rewarding good work, grooming managers

to perform the various managerial roles expected with emphasis on leadership roles, accountability and responsibility.

(ii) Defining the Mission: Second, the personnel must have clarity as to their mission. Every agency in the US has a clear mission statement. This gives every employee a focus. The mission of the US Forest Service for example is- Caring for the land and serving people. In India personnel are rarely aware of what their mission is. The mission of forestry in India must capture the essence of good intentioned forestry practice – meeting livelihood and forestry needs of society while making available ecosystem services without compromising on ecological integrity. In India where the rural poor meet their livelihood needs with tacit support of local forest personnel it is time to make official this arrangement supported with sustainable plans. The first step is therefore to come out with a mission statement and this statement must be clear to every employee of the department as well as the public.

(iii) Realizing the Mission- Plans: Third, management practices must be covered by written plans for different levels. The plans must be steeped in sound science and managerial principles. The Plans provide for integration, inclusiveness and adaptability. For India the plans at the following levels are suggested:

a. Country level.

b. State level.

c. Division level.

At present focus is on Division level plans only as a result issues such as connectivity of wildlife populations, inter state issues and inter-country issues are not addressed.

a. Country level plans would address the Goals, objectives, strategies and action plan at country level and would cover inter-state issues including monitoring of forestry practices in the States. Issues that are inter-country would also be looked at. The plans must detail the managerial principles and the science that will be employed

b. State level plans would be country level plans focused on State issues and inter-state issues.

c. Division level Plans would need to be enlarged and better termed as Ecosystem Plans. The Ecosystem Plans would detail how the forest ecosystem is to be managed and how livelihood and forestry needs of society is to be met while making available ecosystem services without compromising on ecological integrity. This is important in the context of the dependency on forests by local community, the recent enactment of The Scheduled Tribes and other traditional forest dwellers (recognition of forest Rights) Act, 2006, the important ecosystem services that provided by forests to society and the importance of sustainability of systems. The plans

would detail protocols for conducting inventory and for monitoring and management of habitat and species.

(iv) **Systems and Procedures**: Fourth, all activities are to be undertaken through well laid down systems and procedures. Protocols for conducting inventory and monitoring and management of habitat and species at beat level are specified based on scientific studies. All systems and procedures for documentation, reporting, monitoring and planning are codified and institutionalized through systems of certification for individuals and institutions. In the US certification by agencies such as the FSC and the SFI are resorted to. In Kerala the second author had initiated an audit of sanctuaries this can be built upon.

(v) **Focus on Protection**: Fifth, focus is centered on protection. In the US there is a strong system of enforcement. In India this is perhaps the weakest as a result vast amounts of forest produce leave forest areas daily without any record. The beat is to be strengthened with appropriate infrastructure and with relevant changes in the rules such that staff is resident within the beat at all times. Each beat will be supported by four tribal 'Forest Beat Assistants' on the model of the "Bagh Heralu" network[19] drawn from amongst the local community trained to conduct inventory and monitor habitat and species as well conduct/assist/supervise management activities occurring within the beat.

(vi) **Integrating technology**: Sixth, technology is the central core of the model. Ironically the forest department has failed to utilize the gains of the IT sector in spite of India's strong IT presence the world over. Technology inputs at the beat level through supply of hand held computing facilities such that information is easily input into the system for decision-making. Advances in GIS mapping to be integrated.

(vii) **Collaboration with researchers**: A close liaison with researchers so that the pool of researchers is put to practical use is imperative. In the US there is a very healthy interaction with researchers and this drives research that is practical oriented resulting in a win: win situation. The department should enter into collaborative research and the research wing must be geared to perform as a scientific arm of the department.

(viii) **Collaboration with conservationists**: Collaboration with conservationists whereby some works can be shared depending on expertise and funding possibilities both at national and international level are to be explored.

Conclusion:

There is a growing concern, a sense of helplessness and a numbing fear amongst the international conservationists and forest professionals who care that there is a slow but sure decline in tiger numbers and soon they could fade away into oblivion. The tiger gives a face and a measurable index of the status of forest management in India. The fate of the tiger reflects a fate that awaits mankind. Sariska is an important

wake up call. With the writing on the wall at this climate of change it is up to forest professionals to grab the opportunity and initiate action. Foresters as stewards of the nation's forest resources also shoulder an important responsibility to take forest management to a new level in this changing climate. The integrated model presented offers this avenue. However embracing change is never easy for any system resists change. The quality and commitment of leadership will determine whether an organization can embrace change. Posterity will remember us for the decision that we choose to take today.

Acknowledgements.

The authors would like to thank the Government of India and the Government of Kerala for the necessary permission for undertaking the Fulbright Program and the United States Educational Foundation in India for sponsoring the Program. The Concordia University for being academic hosts and the management experts of the College of Business and Organizational Leadership for facilitating the development of the model, the US government agencies and its personnel - US Forest Service, US Fish and Wildlife Service, National Park Service, US Geological Service, Department of Interior, Department of Natural Resources Minnesota and South Carolina, Universities- Cornell, Minnesota, Duke, Clemson, and South Carolina. Researchers at the US Forest Service, the Patuxent Wildlife Research Center, The Wildlife Conservation Society, the Smithsonian's, The Earth Institute, The World Resource Institute and the Save the Tiger Fund and the many others who shared their time effort and information that made this study possible.

References.

[1] http://www.fao.org/forestry/climatechange/en/

[2] http://www.museum.state.il.us/muslink/forest/htmls/intro_def.html

[3] http://choo.fis.utoronto.ca/FIS/Courses/LIS1230/LIS1230sharma/history4.htm

[4] http://management.about.com/cs/generalmanagement/a/Management101.htm

[5] Corrie, B. 2006. Managemnet of Nilgiri tahr- a systems approach. The Indian Forester. December 2006. pp9-33.

[6] Corrie, B. and Corrie, S. 2005. Tiger Conservation- adopting a systems approach. The Indian Forester. Oct. 2005. pp 1297-13:04.

[7] Corrie, B.S. An operational model for tiger conservation in India. Presentation to the World Bank. 2008.

[8] Corrie,B. 2004. Conduct of technical audit of sanctuaries. Kerala Forest department. 2004.

[9] Manley Patricia N et al . 2006. Multiple Species Inventory and Monitoring Technical Guide. Version 1.0. USDA Forest Service.

[10] Sittauer Anne. 2005. Sherburne National Wildlife Refuge. Comprehensive Conservation Plan. US Fish and Wildlife Service.:

[11] Department of Natural Resources. Minnesota. 1992. Woodland Stewardship Plan.

[12] Scott Gurney. 2008. Biographical portrait Theodre Roosevelt.. Forest History Today. pp58-61.

[13] Douglas W. MacCleery. 2002. American Forests. A history of resiliency and recovery.

[14] Damania R, Seidensticker J, Whitten T, et al 2008. A Future for wild tigers. World Bank

[15] WWF,WCS,Smithsonian,STF .2006. Setting priorities for the Conservation and recovery of Wild Tigers: 2005-2015.

[16] Karanth U and Nichols J.D. Ed. 2002. Monitoring tigers and their prey. A manual for researchers, managers and conservationists in tropical asia. Center for wildlife studies.

[17] Corrie, B. The PRISM approach lecture Series. 2006. Concordia University Singh

[18] Williams B.K, Szaro R.C, Shapiro C.D. 2007. Adaptive Management: The US Department of Interior Technical guide. Adaptive Management Working Group.

[19] Gurung B, Smith James and Shrestha M.2006. Using a "Bagh Heralu" network to map the metapopulation structure of tigers in Nepal. Conservation Biology in Asia.