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NEWS

Forest Resources Assessment

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Editorial

Dear readers,

Many thanks are due to our guest editor for this issue, Giovanni Preto. He was involved in the FAO Forest Resource Assessment 2000, and this experience has not deterred him from offering to guest edit an ETFRN News issue on *'Forest Resources Assessment: Issues and Perspectives'*. In his overview article (p.5) he presents the objectives for this issue. He also highlights the challenges in forest resources assessment. These are definitely not limited to finding and applying the newest inventory techniques.

Many of the unanswered questions relate to the actual use of the assessment information in forest management and policy development. This is a recurring theme in most development-oriented research: how does one bridge the gaps between research, policy and practice; and how can research results be communicated in such a way that they contribute to sustainable development? One example of an attempt to bridge some of these gaps was the ETFRN workshop on participatory monitoring and evaluation of biodiversity (p.2 and p. 75). The workshop explored the potential of participatory assessment, monitoring and evaluation of biodiversity (PAMEB) for reconciling local and national information needs in biodiversity management. One of the conclusions was that 'The *process* of negotiating, observing and analysing indicators may bring about more change than the data gathered itself, and in particular can enhance benefit-sharing, as well as be more sustainable than externally led processes. However to achieve this, changes in education, training of scientists, and institutional networking are needed.'

This leads to the thought that in forest resources assessment research, probably as much attention should be paid to the process, and to who should be involved, and at what stage, as to the development and use of new techniques. The new techniques discussed in this issue do present exciting opportunities. Visualising land use change through satellite images and aerial photographs can be a powerful tool to generate discussion on the use and management of forest and land resources. Has anyone been involved in using GIS in participatory assessments of forest resources?

Hoping you will enjoy reading this issue; please remember that ETFRN CU always welcomes comments, and contributions for future issues. Please note the themes and deadlines for the next two issues on the back cover.

Willemine Brinkman
ETFRN Coordinator

PS Please note that we have included a list of past issues on the last page, following a suggestion by one of the participants in the ETFRN Steering Committee.

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forest report 1997. Dehra Dun, India, Ministry of Environment and Forests.

Forestry Commission 2001. http://ndad.ulcc.ac.uk/datasets/3/series.htm. Visited Nov. 25, 2001.

Holmgren P, EJ Masakha and H Sjöholm. 1994. Not all African land is being degraded: a recent survey of trees on farms in Kenya reveals rapidly increasing forest resources. Ambio, 23(7): 390-395.

Kleinn C and contributions of 9 other authors. 1999. Compilation of Information on Trees Outside the Forest. Regional Special Study for Latin America. Unpublished report to FAO, 15.5.1999. 61p + annexes.

Kleinn C. 2000. On large area inventory and assessment of trees outside forests. Unasylva 200 (2000/1) Vol. 51. p.3-10.

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Mapping Human Induced Threat to a Sanctuary, South India

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Introduction

Conservation and management of the network of protected areas is becoming the major practice for protecting biological diversity, especially in tropical countries such as India. These protected areas however, are not completely insulated from threats and are frequently subject to human associated pressures from both within and outside.

These pressures are temporally dynamic and spatially heterogeneous. These threats are particularly severe in the developing tropical countries where the daily needs of millions of humans dwelling in and around forest ecosystems are derived from the protected areas. But most of these pressures are not easily visible and quantifiable. Consequently, identifying the sensitive areas that require special attention and protection is a demanding task and as yet there are no generalized methodologies available to construct models of such threats in protected areas.

Understanding these pressures is important for formulating appropriate management strategies. Recent developments in GIS and RS techniques have offered fresh opportunities to address these issues more efficiently.

Methods

Here we describe a general protocol of developing such threat maps and demonstrate its application to the Biligiri Rangaswamy Temple wildlife sanctuary (BRT sanctuary) (77- 77°16' E and 11° 47'–12° 9'N), a wildlife protected area that is uniquely complicated due to human settlements within its boundaries. It harbors about 6000 indigenous people in 57 settlements who are dependent to a great degree upon forest products, farming and plantations located inside the forest. We also evaluate the resultant threat maps of the sanctuary with field data and discuss strategies to mitigate the threats. During our work in and on the sanctuary for the past ten years, we have identified the most important threats that are likely to be affecting the forest health structure and diversity.

We considered the human settlements, human, cattle, and sheep population, roads and slopes of the areas as the factors influencing threat levels. We divided the entire sanctuary into 30 ha grids and for each grid we computed three types of threat values: a) the settlement associated pressures from human populations, cattle and sheep, b) developmental activity associated threats due to major and minor roads in the sanctuary and c) the accessibility threats due to steepness of the terrain. Combining these three components we derived a composite threat value for each grid and correlated it with a) observed parameters of disturbance b) disturbance activity levels and c) tree diversity of the grids. The details of the computation of threat values will be published elsewhere (Barve, et. al. 2002, communicated to Conservation Biology).

Results

The threat values were found to reflect the actual disturbance caused by harvesting and grazing and the disturbance activity levels of the grids. Highly threatened areas also had low tree diversity suggesting that the derived threat maps do reflect the actual levels of anthropogenic pressures. We propose that the protocol followed here for mapping threats to the sanctuaries can be applied to other areas as well, with appropriate modifications.

Based upon the identified threat components, we suggest the following mitigation measures to maintain the health of the ecosystem of the BRT sanctuary: a) Ban plantations and encourage the labour force working there to settle outside the sanctuary by means of suitable incentives. b) Facilitate the willing forest dwellers to move and settle outside the sanctuary. Alternatively encourage agro-forestry such that the dwellers derive their needs from within their agro-ecosystems. c) Provide more protection to the flat areas identified in the maps. d) Facilitate erecting 'invisible' barriers along the edges such that the impact of the villagers settled outside the sanctuary and their activities on the forest is minimized. This can only be done by creating alternate sources for their needs and by making them realize the importance of the forest for their agriculture. e) Avoid the 'tragedy of commons' syndrome by regulating access to resources.

Implications

The methodology developed demonstrates the identification of sensitive and threatened areas of a sanctuary. Based upon several physical parameters and socio-economic data layers and by using GIS tools, we show that threat maps developed for protected areas indeed represented the actual disturbance levels to different areas of the sanctuary. The methodology followed is not location specific and hence can be employed for any protected area and other forest ecosystems with appropriate modifications. The protocol is less demanding on

groundwork and thus could serve as a cost effective procedure for developing management strategies in areas constrained by resources.

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Forest Inventory and Sustainable Forest Management on the hillsides of the Dominican Republic

PROCARYN [1] – a practical experience

by Peter Henning

Introduction

The project area of PROCARYN is situated in the watershed of the upper Yaque del Norte river on the central hillsides of the Dominican Republic. The watershed is one of the most important with respect to issues related to water (protection and production) as well as the supply of classical forestry products (wood).

The project PROCARYN aims to support smallholder farmers in their efforts to conserve and sustainably manage their natural resources, in particular forest resources. Reforestation and sustainable forest management play a central role in this context. The project applies two different forestry inventory methods to provide data for the generation of development management plans for the forestry resources of the watershed.

Satellite image based inventory

One inventory aims to obtain general information about the forest resources of the watershed, by using satellite images of Ikonos. The project will be assisted by a student of the University of Göttingen taking her doctorate in this field. The information the project will obtain includes the extent of different forest types as well as estimated volumes per forest type and hectare.

With this information the project will be in the position to:

- calculate the production potential of the forest resources of the watershed
- identify the needs to reforest wasteland or agricultural land on steep slopes
- monitor the change of forest vegetation by comparing the results of this inventory with future inventories conducted in 5 or 10 years time

Forest inventory for management plans

The project elaborates management plans for the forest resources of its partners (in the great majority smallholder farmers). For this purpose more detailed information about these resources is required.

The inventory for relatively small plots which vary between 1 and 100 hectares (the majority up to 20 ha) aims to obtain the information that is necessary to develop a sound (but simple) management plan that functions as a suitable planning, implementation and management tool.

The inventory follows the steps below:

1. measuring the boundaries of the smallholders compounds, including all different land use types (with GPS)
2. differentiation of agricultural crops and forest resources (GPS)
3. differentiation of different stands within the forest resources – production and protection (GPS)
4. description of the characteristics of each stand
5. sample survey to obtain quantitive information on the stand

The most important steps seem to be step 4. and 5., since they collect the basic information, required to develop the management plan and later on, to monitor the interventions.

Description of the characteristics of each stand

Describing the characteristics of the stand is the linchpin of the inventory. Collecting qualitative information about the stand leads to a sound decision about how to manage it and define the aims and goals of the stand's management.

The description is short and easy to conduct and compiles the following information:

- Exposition
- Inclination
- Tree Height
- Development stage of the stand
- Structure and composition of the stand
- Origin of the stand
- Canopy density
- Conditions of the crowns
- Stability of the trees
- Quality of the stems
- Susceptibilities
- Observations

All these characteristics of a tree stand are collected using a standardised form and a standardised language. This is important since different users of the information should be able to understand it in the same way.

Sample survey

In order to obtain information on wood volumes, basal area and density, it is necessary to conduct a survey that gathers exactly this information. In the case of PROCARYN a simple sample plot method seems to be the most adequate. The project uses the Bitterlich relascope with plots of varying sizes. This method is easy and very quick.

Within the plot the following data are collected:

- Number of trees within the plot
- DBH of each tree within the plot
- Number and DBH of trees which will be felled.

Use of inventory data

The description of the stand as well as the results of the sample survey form the basis for the management plan. The information obtained is used to describe the state of the art of the different stands, and it enables the development of long- and short-term goals for the all activities to be conducted.

The resource owner receives information about wood volumes and qualities to be harvested and a sound analysis of the production capacity of his forest resources. Therefore the management plan is not only a planning and monitoring tool for foresters but an important tool for the forest owner to calculate the economic benefits of the forests.

The management plan is elaborated on a 5-year term basis. After 5 years a new plan must be developed. This means, that all the steps mentioned above will be conducted again. Thus changes are easy to monitor. The comparison of the situation of the forest resources every five years can reveal changes in the structure, composition, quality and wood volumes of the forest resources. This information will have important implications for decisions about management strategies and activities.

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