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Biodiversity Conservation and Management of Forest Resources in Bori Wildlife Sanctuary of Hoshangabad District of Madhya Pradesh

Dr Ashish Yadav* Assistant Professor JNS Govt. P.G College, Shujalpur, Shajapur, MP, India, Pincode - 465333 Email: drashishyadav93@gmail.com
Dr. Anjali Namdeo* Assistant Professor
Govt. College Mohangarh, Tikamgarh, MP, India
Pincode-472101
dranjali156@gmail.com

Abstract

The Bori wildlife sanctuary, situated in the Hoshangabad district of Madhya Pradesh covers an area of 518 $km^{2.}$ It is bounded by the Satpura National Park to the North and East, and by the Tawa River to the West. The sanctuary together with the Satpura National Park and the Pachmarhi Sanctuary, forms the Pachmarhi Biosphere Reserve. The sanctuary is mostly covered by mixed deciduous and bamboo forest. The dominant trees include Teak (*Tectona grandis*), Dhaora (*Anogeissus latifolia*) and Tendu (*Diospyros melanoxylon*). Large mammal species include Tiger (*Panthera Tigris*), Leopard (*Panthera pardus*), wild boar or pig (*Sus scrofa)*, Gaur (*Bos gaurus*), Chital deer (*Axis axis*), Sambar (*Cervus unicolor*) and Rhesus macaques *(Macaca mulatta).* Apart from the floral and faunal diversity, this sanctuary is of great archaeological value too. Here, numerous caves have been inhabited by the local tribes. Biodiversity is one of the valuable assets so it should be conserved in every possible manner.

Keywords: Biodiversity, Bori, Conservation, Resources, Sanctuary, Sustainable.

Introduction

Biodiversity is the genetic diversity within the species. Approximately nine million types of plants, animals, protists, fungi and seven billion people inhabit the Earth. Environment has been of special importance in Indian culture society. There has been a provision for the worship and protection of nature in Indian culture. The sacred groves of Pachmarhi Biosphere reserve of India were rich in genetic diversity & composed of ethnobotanical plants (Kala, 2011).) Human included religion to conserve forest wealth as trees *viz.*

Peepal, Banyan, Neem and Tulsi are associated with Lord Shiva, Vishnu and Lakshmi are the best way to preserve these plants. Biodiversity has a significant effect on the productivity and stability of ecosystem. The impact of biodiversity productivity and stability are more significant than either climatic or nutrient influences. Biodiversity makes ecosystem productivity more adaptable to climate extremes (Roe *et al*., 2019).

Biodiversity is the foundation upon which human civilization has been built. Thousands of years ago, Indian sages provided a scientific basis for preserving the forest and its wealth (Alfred, 1998) The biodiversity richness of India is due to its geographical location (8º– 30ºN and 60º– 97.5ºE longitude/latitude) which accounts for diversified climatic conditions. The Wildlife Institute of India has divided the country into ten bio-geographical regions. These are: Trans-Himalayas, Himalayas, Desert, Semiarid, Western Ghats, Deccan Peninsula, Gangetic Plain, North Eastern region, Coasts, Islands. According to Kulkarni (2012) loss of biodiversity is irreversible process which will alter the functioning of ecosystem. To develop the comprehensive understanding of the problems of the Biosphere reserve, different factors that determine the extent of dependency of the villagers for the extraction of non-timber forest products (NTFPs) were identified and analysed by Dash and Behera (2013). Biodiversity is very important to the national economy so the government has been continuously emphasizing to conserve biodiversity and sustainable development (Khan *et al*., 1997). The threat to biodiversity is not uniform worldwide (Hilton, 1995). However, there is necessity to study biodiversity loss which leads to extinction of flora and fauna species. National Forest Policy was enacted in 1988 to maintain ecological balance & ensure sustainability of the environment in which India has set a target of thirty-three percent forest cover. The Bori wildlife sanctuary, situated in the Hoshangabad district of Madhya Pradesh covers an area of 518 km^2. The sanctuary, together with the Satpura National Park and the Pachmarhi Sanctuary, forms the Pachmarhi Biosphere Reserve. The sanctuary is mostly covered by mixed deciduous and bamboo forest. The tropical deciduous forest with dominant trees include Teak (*Tectona grandis*), Dhaora (*Anogeissus latifolia*) and Tendu (*Diospyros melanoxylon*), *Terminalia tomentosa, Bauhinia retusa, Bauhinia racemosa, Aegle marmelos, Emblica officinalis, Syzygium cumini, Ricinus communis* . About 1300 exotic plant species are protected in this reserve forest cell including Bryophytes and Pteridophytes. The common Pteridophytes inhabiting in moist areas includes *Adiantum philippense, Dryopteris prolifera, Ceratopteris thelictroides, Selaginella lepidophylla and*

Lycopodium clavatum. Traditional beliefs by the tribals serve an important role in the conservation of plant resources (Quamar and Bera, 2014)

The present study was undertaken with the aim to investigate the impact of enforcement of government regulations on the development and protection of forests area. The management of forest resources and biodiversity were studied in the Bori wildlife sanctuary of Hoshangabad district in order to save it and to study the factors responsible for the proper management of resources for Sustainable development.

Methodology

Area of the Study

The Bori Wildlife Sanctuary is situated in the Hoshangabad District of Madhya Pradesh state in the Central India. It is the India's oldest forest preserve, established in 1865 along the Tawa River. The sanctuary covers an area of 518 $km^{2.}$ It is bounded by the Satpura National Park to the North and East, and by the Tawa River to the West. The sanctuary, together with Satpura National Park and the Pachmarhi Sanctuary, forms the Pachmarhi Biosphere Reserve. The sanctuary has been declared as a wildlife sanctuary under the Wildlife Protection Act, 1972 for the first time in 1975 and subsequently in 1977 by Govt. of MP notification No.15/22/76/X (8) dated 1-6-1977 and then Satpura national park was created, out of Bori and Pachmarhi Sanctuary vide Govt. of MP notification No,15/12/80-X(2) dated 13-10-1981 (Tiwari, 1997) (Table 1). Hoshangabad district has 08 tehsils (Hoshangabad, Babai, Itarsi, Sohagpur, Bankhedi, Piparia, Seonimalwa and Dolaria), 07 developmental block (Hoshangabad, Babai, Kesal, Sohagpur, Bankhedi, Piparia, Seonimalwa) and 975 Villages (Fig. 1). The region is dominated by tribals like Gond and Korku. They depend upon forest resources for their needs. This old relationship between the two enables them to gain knowledge about the property and behavior of plants and animals around them. This knowledge is transferred from one generation to another (Upadhyay, 2013; Martins, 2014; Wambugu *et al*., 2018). Four rivers *viz*. Narmada, Tawa, Dudhi and Denwa flows in this district. The climate is moderate with an average rainfall of 134 cm. It has been reported that nearly 10.4 million people residing on 15% of total Indian Geography and constitutes about 8.6% of total Indian population since tribes/ indigenous people/aboriginal/Adivasi are residing antediluvian in forests. (Tripathi, 2016) (Table 2). The sanctuary comprised mainly of teak (*Tectona grandis*), dhaora (*Anogeissus latifolia*), tendu (*Diospyros*

melanoxylon) (Patil, 2013) and an ideal habitat for large mammals like Sambar, Gaur, Nilgai, Chital and their predators like tiger, leopard and wild dog (Talukdar and Gupta, 2017)

S.No	Wildlife sanctuary	Old sanctuary		New area (Hectare)	Total (Hectare)
		Name & year	Area (Hectare) 1975/ ¼gs		
1.	Bori wildlife sanctuary	Bori Sanctuary 1975	79781.041	-	79781.041
	-	-	866.031		866.031
	Total		80647.072		80647.072
2.	Pachmari Sanctuary	Bori Sanctuary 1975	13736.458	9310.068	23046.526
			31951.912	2698-443	34650-355
Revenue				7731-244	7731-244
Total			45688-37	19739.755	65428.125

Table 1 : Area of Bori Wildlife Sanctuary
Source: According to Notification, 1977

Fig 1: Map of District Hoshangabad

Survey Method

In order to carry out study related to biodiversity on flora and fauna species in Bori wildlife sanctuary, preliminary surveys were conducted followed by the collection of detailed information about local culture and tradition to meet the long term conservation strategy. A mixed-method approach was followed to collect both quantitative and qualitative data. Quantitative data were collected by candidature questionnaire survey in the selected

villages of Bori wildlife sanctuary. (Table 2). Both male and female co-operated during the survey. Through questionnaire survey, the information was collected on the means of proper arrangements for the protection of animals, the contribution of Janbhagidaari samiti in the proper maintenance of the forest and the effect of government policies in the forest resource management.

S.No.	Tehsil/Block	Area (Sq.km)	Population
1.	Babai	583	134364
2.	Bankhedi	636	125682
3.	Dolaria	172	57603
4.	Hoshangabad	231	165749
5.	Itarsi	1032	240719
6.	Pipariya	1032	181261
7.	Seoni malwa	1359	186788
8.	Sohagpur	1612	149184

Table 2: Number of Population of Tehsils of Hoshangabad district
Source: Census of India, 2011, District Hoshangabad

Result

Forest resources are natural and fundamental resources that provides items for daily use to humans. Rural people rely directly or indirectly on the forest resources to meet the basic needs as fuelwood, fodder etc. (Khonkaen and Cheng, 2017; Sekhar, 2003). Management of forest resources has been challenging for the government. For the proper maintenance of forest and forest resources, the government has to take a concrete and strict step which proves non-beneficial for the forest community. However, the government manages forest resources for the benefit of humans apart from physical management. Forests and humans are complementary to each other (Upadhyay and Hyde, 2012). The programs were executed in a systematic manner by the government for the maintenance of

forest resources. From the administrative point of view the work has been proposed at the National level. The Bori wildlife sanctuary is one of the oldest sanctuaries in India. Under the Wildlife Protection Act, 1972 the Bori Wildlife Sanctuary, Pachmari Sanctuary and Satpura National Park has been managed.

In general, it seems that a government scheme does not prove significant on forest wealth management, but it is not so at all. Government schemes are long-term and implementation is the biggest challenge. Government schemes are implemented by forest department management. They made various schemes to preserve the forest resources. Scheme is operated from Sanjeevani Ayurveda Center, under which semi and fully processed minor forest and medicinal products are sold to the general public through sales centers. National Medicinal Plants Board, New Delhi has approved a scheme of Rs 230 lakh for a total area of 1200 hectares to District Union Hoshangabad and other districts for strengthening the resources of medicinal plants under which medicinal plants have been planted in 720 hectares so far. The work of the government is not limited to get revenue from forests, but also to spend on community welfare and regeneration of forests are also the main objective of the government. People are being trained for regeneration of forests in district Hoshangabad. Research in government schemes emerged as a better option. The management of the forest area cannot be decided only on the data. For this, research and forecasting towards the future are necessary. The inclusion of Bori Wildlife Sanctuary in the Satpura Tiger Reserve area is the result of this.

In the present research work, a hypothesis was made for the work plans related to forest wealth management. The two types of variables were taken to test the truth viz. government policies and plans as independent variable and forest resource management as dependent variable. The cooperation and activities of the government and regional public have been studied for the management of Bori wildlife sanctuary in the Hoshangabad district. The economic prosperity of the state depends on the forest because primary, secondary and tertiary sectors get raw material from forest only. Forests play an important role in the regional economy as well as in the national economy (Bhargava, 2002). The government has a plan to relocate tribals to different villages for forest conservation. For the all-round development of the tribals, many types of schemes are prepared and implemented for their economic and social assistance (Jactel, 2018)

Discussion

The present study was conducted to study the methods of conservation and management of forest resources in the Bori wildlife sanctuary of Hoshangabad district of Madhya Pradesh. The same approach of sustainable use and preservation was studied earlier by many investigators (Munro and Holdgate, 1991; Singh *et al.*, 1994; Jain, 2000)

Diversity is an inherent characteristic of nature, which suffuse the whole universe. Human activities such as urbanization, deforestation leads to climate change resulting in loss of species (Niesenbaum, 2019). The highest biodiversity loss rate currently in the tropics was reported by Kremen and Merenlender (2018). Biodiversity supports human wellbeing globally by their ecological functions and their degradation ultimately affects humanity (Heywood, 1995). Diversity of medicinal plant is continuously under the threat of extinction as a result of over-exploitation. India is one of the twelve mega biodiversity centers of the world. It has been accepted that indigenous medicines are more economical and more acceptable (Singhal *et al.*, 2003). The present knowledge of use of medicinal plants has been gathered through ages since Vedic period. The uses of plant resources have been documented in Charak Samhita, Sushruta Samhita and Books on Ayurveda. A survey was conducted at the Pachmarhi Biosphere Reserve (PBR) to understand the utilization and diversity of medicinal plants.

The loss of biodiversity in flora can be categorized into two: commercial use and developmental activities. Commercial use of flora is the source of revenue for tribal people in rural areas of India whereas developmental activities causes harm for flora species as reported by Anil *et al.*, 2014. It has been stated that protected areas are amongst the most important tool in maintaining biodiversity and natural resources (Sujithra *et al.*, 2021). To protect tiger population, a recovery plan was developed which results in the increase of tiger poplation due to interlinking of rivers of Panna Tiger Reserve (Parveen and IlYas, 2021). They are managed by various programme initiated by the government and accompanied by the people (Margules and Pressey, 2000; Heinen, 1996). To attain the goal, the Government of India proposed a multi-tier system for the conservation of resources (Singh and Dukariya, 2021). The tribals of the Bori wildlife Sanctuary were planned to relocate to different villages to conserve biodiversity which was similar to the study conducted by Muhumuza and Balkwill (2013). Human actions were destroying the

Earth's ecosystems, eliminating genes, species and biological traits at an alarming rate (Bradley, 2012). The resources on Earth are limited so we have to alter our ways otherwise be sooner or later it will be exhausted. The usage of resources will deplete if not done in a sustainable manner. (Ramadoss and Poyyamoli, 2011)

Sustainable development helps to develop the attitudes, skills and knowledge to make decisions for the benefit of themselves and others, now and in the future. Based on recent perception, sustainable development not only depends upon living systems but also to its basic assets on which living system depends (Oliver, 2015)

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