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Biodiversity of Penha-de-Franca, Goa, India

Anasuya Ganguly[1], Pradip Vithal Sarmokadam[2], Kundan Kumar[3] and Srikanth Mutnuri[4]

[1]Department of Biological Sciences BITS-Pilani, K K Birla Goa Campus
[2]Member Secretary, Goa State Biodiversity Board
C/o Department of Science, Technology & Environment Saligao, Bardez, Goa
[3]Department of Biological Sciences BITS-Pilani, K K Birla Goa Campus
[4]Department of Biological Sciences BITS-Pilani, K K Birla Goa Campus
E-mail: [1]ganguly@goa.bits-pilani.ac.in, [2]pradipskadam@gmail.com,
[3]kundan@goa.bits-pilani.ac.in, [4]srikanth@goa.bits-pilani.ac.in

Abstract—*Penha-de-Franca is a panchayat in North Goa, in Bardez taluka. Geographical area of the Panchayat is 4468725 Ha. Human population under the Panchayat Samity is15342: Total (Male: 7816 Female: 7526). Habitat and Topography is mainly coastal, hilly region with ample forest cover. Land use pattern (Nine fold classification available with village records) Management Regime: Reserve Forests (RF) / Joint Forest Management (JFM) / Protected Areas (PA) / Community Owned and Managed Forests (COM) Currently we undertook the task of making the PBR (People's biodiversity register) for this panchayat from September 2016. We were designated as the TSG(Technical Support Group) by the GSBB(Goa State Biodiversity Board). In this report we showcase the biodiversity of the place, the difficulties we faced during the process, and the final outcome.*

Keywords*: PBR, Goa, Biodiversity, Traditional Knowledge*

1. INTRODUCTION

The Biological Diversity Act, 2002 (No. 18 of 2003) was notified by the Government of India on 5th February, 2003. The Act extends to the whole of India and reaffirms the sovereign rights of the country over its biological resources. Subsequently the Government of India published Biological Diversity Rules, 2004 (15th April, 2004). The Rules under section 22 states that 'every local body shall constitute a Biodiversity Management Committee (BMC's) within its area of jurisdiction'.

The mandate of the Biodiversity Management Committee has been clearly highlighted in the Biological Diversity Rules 2002 as follows:

a. The main function of the BMC is to prepare People's Biodiversity Register in consultation with the local people. The Register shall contain comprehensive information on availability and knowledge of local biological resources, their medicinal or any other use.

b. The other functions of the BMC are to advice on any matter referred to it by the State Biodiversity Board or Authority for granting approval, to maintain data about the local vaids and practitioners using the biological resources.

c. The Authority shall take steps to specify the form of the People's Biodiversity Registers, and the particulars it shall contain and the format for electronic database.

d. The Authority and the State Biodiversity Boards shall provide guidance and technical support to the Biodiversity Management Committees for preparing People's Biodiversity Registers.

e. The People's Biodiversity Registers shall be maintained and validated by the Biodiversity Management Committees.

The National Biodiversity Authority shall provide guidance and technical support to the Biodiversity Management Committee (BMC) for preparing People's Biodiversity Register. [2]

2. PEOPLE'S BIODIVERSITY REGISTERS (PBR)

The evolution of human societies over several millennia is closely related to plants and animals. The domestication of crop plants and farm animals about 12000 years ago revolutionized the human civilization by creating more stabilized societies. The early historic and medieval period gradually reduced human interaction with the wild plants and animals. The development of modern science and technologies during the industrial and post-industrial period did not do away with our link to nature. Different groups of people continue to depend on natural resources at varying scales. Some draw resources from across continents while others within a country or a region. There are also people continue to depend on locally available biodiversity and bio-resources for their livelihoods. Such population who are directly dependent on local biological resources have, through their keen sense of observation, practices, and experimentation developed and established a body of knowledge that is passed on from generation to generation. Some are widespread traditional

knowledge like cultivation practices; others are highly specialized such as bone setting or jaundice, which are generally passed only to close members of the family.

India is land of biological and cultural diversity. It is one of the mega biodiverse countries of the world. It also the home of a large number of tribal groups, pursuing different kinds of nature based livelihoods. In addition, a large number of farming and fishing communities and nomadic groups posses traditional knowledge of varying degrees. The development of modern science and technologies notably biotechnology and information technologies have increased the value of biodiversity and associated knowledge including traditional knowledge (TK) .The growing importance of biodiversity, bio-resources and associated knowledge is fairly well understood. The first step towards conservation is sustainable utilization of biodiversity and its documentation. Biodiversity and associated knowledge is found in different ecosystems, under different legal management regimes and hence the results and manner of documentation will also differ. [2]

The present manual guidelines have drafted taking into consideration different ecosystems and include the rural, urban and protected areas. The guidelines may be customized and further information may be added to enrich the effort. It is important to keep in mind some of the issues related to PBRs:

- It is to be undertaken in a participatory mode involving varying sections of village society.
- While documenting, the knowledge and views of both genders are to be recorded.
- Information provided by people need to be collated, analysed and crosschecked by the members of the Technical Support Group (TSG) before documentation.
- The PBR is important base document in the legal arena as evidence of prior knowledge and hence careful documentation is necessary.
- The document should be endorsed by the BMC and later publicized in the Gram Sabha / Gram Panchayat / Panchayat Samiti. The document can be a very useful tool in the management and sustainable use of bioresources. The document can also be a very useful teaching tool for teaching environmental studies at schools, colleges and university level
- The document should be periodically updated with additional and new information as and when generated. [2]

2.1 The PBR Process

The preparation of People's Biodiversity Registers (PBRs) involves the active support and cooperation of a large number of people who need to share their common as well as specialized knowledge. One of the first steps for preparing a PBR is to organize a group meeting to explain the objectives and purpose of the exercise. Different social groups in the village need to be identified for purpose of data collection from those groups. In an urban situation, spots where biodiversity are important need to be identified for the purpose of the study and documentation. The documentation process includes information gathered from individuals through detailed questionnaire, focused group discussion with persons having knowledge and published secondary information. [2]

2.2 Documentation of Traditional Knowledge (TK) related to biodiversity

Documentation of knowledge of individuals with regard to biodiversity and its uses is an important part of PBR. Every effort should be made to identify the persons with proven knowledge of local biodiversity; special attention should be given to the elderly persons who can also provide informations on the biodiversity which was available in the past but no longer seen at present. In some cases focus group discussion may be held for the purpose of documentation.[2]

2.3 PBR Methodology

The PBR is a participatory process requiring intensive and extensive consultation with the people. The objectives and purpose is to be explained in a group meeting in the presence of all sections of people in the Panchayat, members of the BMC, students, knowledgeable individuals and all those interested in the effort. Documentation includes photographs (including digital images), drawings, audio and video recordings and other records like printed material. [2]

2.4 Process in PBR Preparation

Step 1: Formation of Biodiversity Management Committee (BMC)

Step 2: Sensitization of the public about the study, survey and possible management

Step 3: Training of members in identification and collection of data on biological resources and traditional knowledge

Step 4: Collection of data. Data collections includes review of literature on the natural resources of the districts, Participatory Rural Appraisal (PRAs) at village level, house hold interviews, individual interviews with village leaders and knowledgeable individuals, household heads, key actors of the panchayat raj institutions and NGOs and direct field observations

Step 5: Analysis and validation of data in consultation with technical support group and BMC

Step 6: Preparation of People's Biodiversity Register (PBR)

Step 7: Computerization of information and resources [2]

3. RESULTS AND DISCUSSION

We studied agro-biodiversity, domesticated biodiversity, wild biodiversity including aquatic biodiversity and urban biodiversity with special emphasis on medicinal plants and traditional knowledge holders who uses these plants in treating diseases.

Our final conclusion is that the region is very rich in terms of bio-diversity. It should be protected, explored and shared.

Fig. 1: Map of Penha-de-Franca

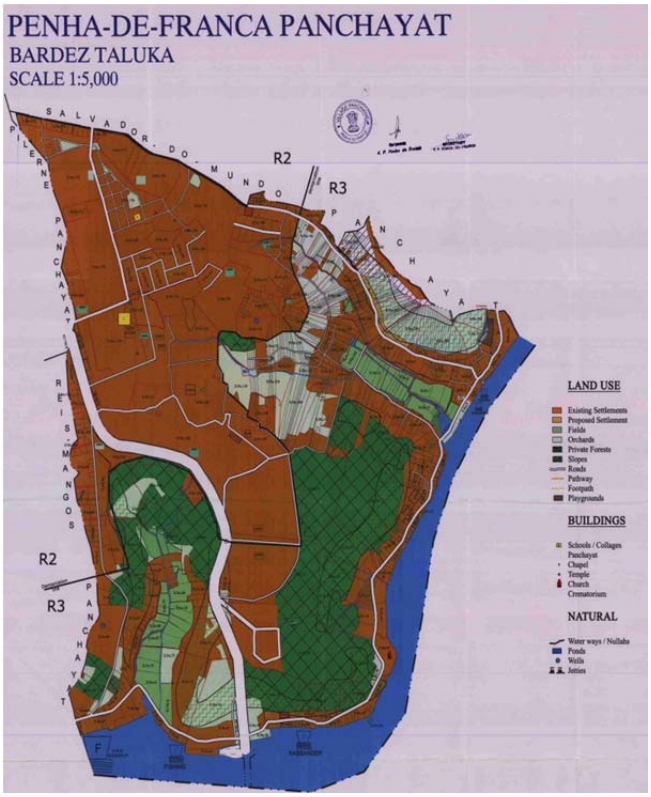

Table 1: Agrobiodiversity-crop plants

1.	2.	3.
Crop	**Scientific**	**Local**
	Name	**Name**
Red Spinach -	*Amaranthus dubius*	Lal bhaji
Coconut	*Cocos nucifera*	Nariel
maize	*Zea mays*	bhutta
Bitter gourd	*Momordica charantia*	karela
Bottlegourd	*Lagenaria siceraria (synonym Lagenaria vulgaris Ser.), also known as opo squash*	Lauki or dudhi
Nut meg	*Myristica fragrans*	Jayphal
Sponge gourd	*Luffa cylindrical Cucurbitaceae*	Dhudhul
Ridged gourd	*Luffa acutagula Cucurbitaceae*	Gosale
Pudinba	*Mentha × piperita*	Mint
Coriander leaves	*Coriandrum sativum*	Dhania
Elephant's foot	*Amorphophallus paeoniifolius*	Suran
Calabash	*Lagenaria siceraria*	White lauki
Pumpkin	*Cucurbita maxima*	Field squash
Snake gourd	*Trichosanthes cucumerina*	serpent gourd, chichinda, and padwal
Okra Ladie's finger	*Abelmoschus esculentus*	Bhindi
Eggplant, brinjal	*Solanum melongena*	Baigan
Cucumber	*Cucumis sativus*	Kheera
Squash	*Sechium edule*	Chayote
Watermelon	*Citrullus lanatus*	tarbooz
Radish	*Raphanus sativus*	Mooli
Fdenugreek	*Trigonella foenum-graecum*	Methi
Muskmelon	*Cucumis melo*	kharbooz
Curry leaf tree	*Murraya koenigii*	Karia patte

Table 2: Fruit plants

Plant	Scientific
	Name
Banana	*Musa sp*
Papaya	*Carica papaya*
Coconut	*Cocos nucifera*
Guava	*Psidium guajava*
Jack fruit	*Artocarpus heterophyllus*
Mango	*Mangifera indica*
Chikoo	*Manilkara zapota*
Kaju	*Anacardium occidentale*
Ramphal	***Annona reticulata***
Sitaphal	***Annona reticulata***
Kala jamun	***Syzygium cumini***
Pineapple	*Ananas comosus*
Pomegranate	*Punica granatum*

Table 3: Pest of crops

Insect / Animal	Scientific name	Local name
Insects	*Lasius niger*	Black ants
Insects	***Coleoptera sp.***	Beetles

Insects	***Ariadne merione***	Common castor Butterflies
Insects	*Endrosis sarcitrealla*	Moths
Birds	***Ardea alba***	Egret
Birds	***Motacilla maderaspatensis***	**White brown wagtail**
Birds	***Hirundo smithii***	**Wire tailed swallow**
Insects	***Libellula luctuosa***	Widow skimmer
Aracnid	*Araneae sp. (Peucetia viridans)*	Spider
Insects	***Romalea guttata***	Grasshoppers
Insects	*Limacodidae*	Stinging Slug Caterpillar

Table 4: some medicinal plants

Plant Type	Local Name	Scientific Name
shrub	Adusa	*Adhtoda vasica*
climber	Karata	*Dodonaea viscosa*
climber	Uski	*Calycopteris floribunda. Combretaceae*
Tree	Shami	*Acacia arabica*
Tree	Belpatri	*Aegle marmelos*

Fig. 2: Some common species found in the area

Squids, calamari
Teuthida sp.

Mackarel
Scomber scombrus

Tisrio, clam- Chicalim shell fish
Bivalvia sp./ Tisryanchi codi

Sardines
Sardinella longiceps sp.

Shrimps
Caridea sp.

Oriental garden lizard
Calotes versicolor

Egret
Ardea alba

White brown wagtail
Motacilla maderaspatensis

Wire tailed swallow
Hirundo smithii

Brahmini kite
Haliastur indus

Common castor mating
Ariadne merione

White moth

widow skimmer
Widow skimmer *Libellula luctuosa*

Tirafal, Curry fruits
Zanthoxylum rhetsa

Adusa
Adhtoda vasica

Kindal - ***Terminalia paniculata***

White Popinac
Leucaena leucocephala

Mangrove trees
Rhizophora mucronata

Oriental White Ibis or Black Headed Ibis
Threskiornis melanocephalus

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Erratum: We apologize if some species names are erroneous in any way. We appreciate any corrections in this regard.

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