
UNIT 2 ACTION PLAN FOR NATURAL RESOURCE MANAGEMENT: MICRO LEVEL PLANNING

Structure

- 2.0 Introduction
- 2.1 Objectives
- 2.2 Components of Natural Resource Management
 - 2.2.1 Biodiversity
 - 2.2.1.1 Peoples Biodiversity Register
 - 2.2.2 Water Management System
 - 2.2.3 Community Gene-Seed-Grain Banks
 - 2.2.4 Linking Cultural Diversity with Biodiversity
 - 2.2.5 Creating an Economic Stake in Conservation: Reward and Recognition
- 2.3 Let Us Sum Up
- 2.4 Key Words
- 2.5 References and Suggested Further Readings
- 2.6 Key to Check Your Progress

2.0 INTRODUCTION

Over the past 50 years, various human activities have resulted in considerable changes in ecosystems quite rapidly and extensively than in any comparable period of time in the history. During this period, as the world population doubled to over six billion people and the global economy increased significantly, the demand for ecosystem services has become a serious concern. While the food production during this period has increased by about two-and-a-half times, the water use in agriculture and domestic activities has doubled, wood harvests for pulp and paper production has tripled, and timber production has increased by more than half (FAO 2007). Agriculture is an essential component of societal well being and it occupies 40 percent of the land surface, consumes 70 percent of global water resources and exploits biodiversity at genetic, species and ecosystem levels. At every point of production, agriculture is influenced by ecosystems, biodiversity, climate and the economy.

While the successes in agriculture production have been realized over the last decades, the inequitable distribution of benefits and unsustainable impacts on natural resources are becoming more evident. The acceleration of environmental degradation and climate change has direct effects on agricultural productivity and food security of over one billion people living in poverty in developing countries. The United Nations Food and Agriculture Organization (FAO)'s recent assessments show that the target of the World Food Summit to reduce the number of food-insecure persons has not been met. This has been so despite many major environmental agreements. Carbon emissions continue to rise, species extinction is continuing and desertification continues to be of great concern in arid, semiarid and sub-humid areas. World agriculture and forestry practices facing increasing incidences of storms, drought and flood and has implications on the viability of agro ecosystems and global food availability. Added to this the destabilization of long-established production systems via stresses such as water shortages, soil quality and heat has increased. A key challenge, therefore, is to safeguard

biodiversity for food and agriculture for future generations as well as maintain a broad gene pool which ensures ecosystem resilience.

The majority of the world's rural poor, about 370 million of the poorest, live in areas that are resource-poor, highly heterogeneous and risk-prone. The worst poverty is often located in arid or semiarid zones, and in mountains and hills that are ecologically vulnerable. In many countries, more people, particularly those at lower income levels, are now forced to live in marginal areas putting them at risk from the negative impacts of climate variability and change. For these vulnerable groups, even minor changes in climate can have disastrous impacts on their lives and livelihoods. Implications can be very profound for subsistence farmers located in remote and fragile environments, where yield decreases are expected to be very large.

Over the centuries, generations of farmers have developed complex, diverse and locally adapted agricultural systems, managed with time-tested, ingenious combinations of techniques and practices that lead to community food security and the conservation of natural resources and biodiversity. These agricultural systems are found throughout the world, and have contributed to preservation of traditional forms of farming knowledge, local crop and animal varieties and forms of socio-cultural organization. These systems represent the accumulated experiences of communities interacting with their environment using inventive self-reliance, experiential knowledge, and locally available resources. These agro ecosystems that are of global importance to food and agriculture are based on cultivation of a diversity of crops and varieties in time and space that have allowed traditional farmers to avert risks and maximize harvest security in uncertain and marginal environments, under low levels of technology and with limited environmental impact.

The challenge is how to restore already affected areas or to prepare rural areas predicted to be hit by these emerging changes. The focus should be on strengthening local institutions, people and communities in problem-solving capacities. Organizing local people around the area to enhance agricultural resiliency and sustainability of the agro ecosystems as well as natural resources must make effective use of traditional skills and knowledge. This will provide a launching pad for additional learning and organizing, thus improving prospects for community empowerment and self-reliant development in the face of emerging global challenges. This unit will provide hands on experience to the participants of the course to undertake exercises in partnership with the local communities and institution in developing an implemental action for ensuring sustainable use of the depleting resources and in ensuring prosperity of the people in perpetuity. This module will be primarily based on the site situation analysis, discussion with the user community and finally helping the community to develop a charter for sustainable management of natural resources. This module would be essentially field based and will require of one week of onsite study and report preparation in an ideally biodiversity hotspots. Primary data collection, structured interviews, group discussions, etc. are the activities envisaged in this module

2.1 OBJECTIVES

After reading this unit, you will be able to:

- understand the role of natural resources on the quality of life for both present and future generations;
- explain the major components of natural resource management; and
- develop a practical and actionable work plan for community to ensure long term sustainability of their natural endowments.

2.2 COMPONENTS OF NATURAL RESOURCE MANAGEMENT

2.2.1 Biodiversity

Conservation and management of biodiversity and natural resources typically confronts great uncertainty and inadequate or incomplete information. Policy and management must recognize and deal with this uncertainty and inadequate or incomplete information. This has been, and is, frequently used as a reason not to take action to protect the environment, particularly when powerful economic interests benefit from the activities threatening the environment. This is a major problem, as frequently it is not possible to have clear scientific evidence of threat before the damaging activity takes place. The precautionary principle can be a powerful tool to confront the use of uncertainty and inadequate or incomplete information as justification for not taking action to protect the environment. It should be widely incorporated into law and implemented through appropriate decision-making, policy and management measures. The case study that is intended to be undertaken in a typically biodiversity hot spot area will try and work out a model for sustainability taking into account the current trends and future threat.

Particular questions to be addressed

- What are the risks and implications of over exploitation of natural resources by and on the society over long periods of time? What are the associated intra-generational effects?
- What changes are necessary in present economic and social policies to incorporate natural resource management?
- What are the different local techniques used by communities, under the community based natural resource management. Do these techniques complement each other?
- What are the different models adopted by indigenous communities for sustainable management of natural resources? How crucial is the sustainability of indigenous communities for natural resource management?
- Have common property rights generally led to a better management of natural resources? What are the different ways in which common property rights can be protected?
- Is natural resource management gender specific and sensitive? Do men and women complement each other or behave differently in the management of natural resources? What is the impact of this gender inequality on decision-making and development?

The outcome of the exercise would be to develop a status report for the location being studied, based on current status, threats to the system and ways and means to mitigate them. This must be based on structured discussion groups, interaction with the experts in the area, and also consulting few of the published reports. This will enable gaining a biological, social and technical dimension to the problems of the region. This will also enable documentation of the traditional knowledge system prevalent in the user society.

2.2.1.1 Peoples Biodiversity Register

The PBR exercise provides a platform for the community members to initiate positive steps to manage their biodiversity resources better. India's Biological Diversity Act provides for just such a forum in every local body in the form of Biodiversity Management Committees (BMC). This act aims to promote

conservation, sustainable use and equitable sharing of benefits of India's biodiversity resources. With this in view it calls for the establishment of a National Biodiversity Authority (NBA), State Biodiversity Boards (SBB) and Biodiversity Management Committees (BMC) at the level of Panchayats, Municipalities and City Corporations. It stipulates that "Every local body shall constitute a BMC within its area for the purpose of promoting conservation, sustainable use and documentation of biological diversity including preservation of habitats, conservation of land races, folk varieties and cultivars, domesticated stocks and breeds of animals and micro-organisms and chronicling of knowledge relating to biological diversity".

A "People's Biodiversity Register" should not be a simple list of plant and animal species and of varieties of cultivated crops and domesticated animals. It should not even be just such a list along with a record of folk knowledge of medicinal and other uses of living organisms. PBR is much more than this, for it should serve as a component of the societal knowledge base for conservation, sustainable use and equitable sharing of benefits of biodiversity. Biodiversity, as defined in the CBD and the Biological Diversity Act, is the variability at the genetic, species as well as ecosystem levels. Hence, a PBR would not only focus on species and varieties, but also be concerned with maintenance and prudent management of ecosystems such as forests and grasslands, ponds and coral reefs. PBRs must be concerned with documentation of many facets of people- ecosystem interactions as well.

The participants of the course will undertake simple sample survey in collaboration with the local communities in assessing the bio-resource status of the location based on the following simple format. This will enable gaining a first hand information on the important resource available at the location, their usage and also give an indication of how much people are aware of their resources and enable the documentation of traditional practices associated with it.

SAMPLE FORMAT

- a. Name of the data collector:
- b. Date of data collection:
- c. Source of information: Name of the knowledgeable individual/User groups(s):
- d. Local name of the cultivated plant/domesticated animal species
- e. Local name of variety:
- f. Local names of other similar varieties :
- g. Time taken to reach maturity :
- h. Type of soil/cultivation/ animal husbandry practice most suitable for the variety:
- i. Size at maturity - specify measure and unit:
- j. Susceptibility to:
 - Pests -
 - Diseases -
 - Low Moisture
 - Water Logging-
- k. Yield – annual: Product, Measure, Unit :
- l. Values assigned by local community members:

- Of great value
 - Of Some Value
 - Nuisance
 - A great nuisance
- m. Parts used :
- n. Uses, including symptoms treated in case of medicinal uses :
- o. Change in uses over the last ten years:

2.2.2 Water Management System

To govern the use of water resource has become a challenging task given the ever-increasing water scarcity and water conflicts. Although devolving responsibility of water conservation and management of water has found a prominent place in the Indian national water policy priorities, it is the use of traditional technical knowledge and local institutions in acquiring, controlling and managing water resource that play a crucial role in the success of new policy interventions.

The structure of the water management bodies need to be a multi-tiered system, with user-stakeholders representing at different levels. The government should retain the right to nominate non-voting members from its departments, who can presumably provide capacity building support and supervision.

Major functions of community water management bodies should be to:

- prepare plan for the maintenance of irrigation system and carry out regular maintenance works with the funds provided by the govt. bodies,
- crop planning matching to local soil and agro climatic condition with focus on crop diversification,
- regulate the use of water in the operated areas and prepare water demand and collection of water rates and
- resolve disputes between the members and water users.

Implementation of participatory water management in a diverse social and economic setting without addressing local socioeconomic, cultural and institutional issues and problems of accountability and transparency would led to sub-optimum community participation and collective action in water management and development.

The participants of the module will be required to develop a document based on the following:

1. **Name of Watershed area:**
2. **Type** (tanks/ reservoirs/ river/ irrigation)
3. **Local Name/s (if any)**
4. **Existing management authority:** There may be a variety of formal as well as informal management authorities pertaining to a given watershed.
5. **Control:** Govt/ Private/ local communities
6. **Existing management system/ practices:**
7. **Gainer User groups:** Certain user groups, local or external, may gain from the existing management system. For example, builders may gain from encroachment on tanks. These manifold interactions may be described in detail.

8. **Loser user groups:** Certain user groups, local or external, may stand to lose from the existing management system. For example, farmers may stand to lose from encroachment on tanks. These manifold interactions may be described in detail.
9. **Other management patterns prevalent in recent past:** Management systems/ practices have been undergoing rapid changes in recent times, and it would be useful to note these experiences, especially from the perspective of devising more effective systems for the future. These manifold experiences may be described in detail. Desired changes / desired future: This would entail documentation of what the various user groups would like to see happen in the coming days.
10. **Desired management system from the perspectives of different user groups:** This refers to the vision of different user groups of a desirable management system. A number of different elements would be involved in this vision. These may relate to
 - a. rights of access to land, waters or biological resources,
 - b. roles of different governmental agencies, private industry, landowners or community institutions,
 - c. local versus outside actors,
 - d. technologies employed, and
 - e. access to capital or markets, and so on.

It would be worthwhile to encourage the community members to give full scope to their imagination and come up with a variety of innovative solutions.

11. **Suggested components for a management plan that can be implemented under present circumstances as a consensus of the gram sabha:** But finally, it is important to examine ground realities, and the community members may be asked to shift from what they would ideally like to see happen to suggesting elements of a management plan that can be implemented under present circumstances and for which a consensus of the gram sabha seems feasible. Different user groups may come up with a range of such plans; all of these may be recorded preserving their perspectives, and taking care not to introduce any bias on part of those involved in the documentation.

This will enable the local community to develop a vision and action plan for sustainable management of their water resources.

2.2.3 Community Gene-Seed-Grain Banks

The use of *plant genetic resources* (PGR) has contributed to the nurturing of agricultural biodiversity for millennia. Yet local and indigenous communities have not profited from more recent commercialization of these resources and are often not facilitated by the products of modern plant breeding. For these communities, *community gene banks* (CGBs) could not only provide back-up storage to increase food security, but also form a measure for putting the concept of *Farmers' Rights* into practice. However, the success of CGBs strongly depends on a national legal framework.

In the domain of *in-situ* conservation, on-farm conservation by rural and tribal women and men has remained largely unrecognized and unrewarded. These communities continue to possess the traditional knowledge to cultivate, use and preserve a large number of land races and folk varieties of crop plants and animal breeds. These practices, which are of great value to sustainable food and nutrition security, have so far been sustained without any benefit or reward accruing to the

community. Establishment of a 'Community-Gene-Seed-Grain-Bank' continuum to ensure both food security and biodiversity conservation; areas of acute water scarcity, water banks have also been established to promote community water harvesting.

To begin with, rapport with the local community was built through Participatory Rural Appraisals (PRAs), village meetings, exhibitions and other extensive interactions. Partnerships with democratically elected institutions such as Panchayats (i.e. grassroots elected bodies with one third representation for women) and Central Village Committees (locally known as *Palli Samitis*) were created to ensure sustainability of the interventions.

Banks with a Difference

Gene Bank – Land races with distinct characteristics are stored for long-term, both by ensuring their continued cultivation in the farm and through cold storage in the 'Community Gene Bank'. The seeds of these landraces are accessed for their genetic material and the economic benefit arising from such use will go to the individual or community who conserved the landrace.

Seed Bank – a facility for storage of excess seeds of farmers, which can be accessed during times of seed shortage. The Seed Bank ensures that seeds are available for cultivation.

Grain Bank – a facility for storage of excess seeds of farmers, which can be lent (and returned with interest) to families in need. The Grain Banks ensure food security of the region and also reduce the danger of seeds being consumed in times of stress.

The three banks have been integrated to support each other. Loss of viability of seeds from the seed bank can be met by gene bank samples. The grain bank supplies excess grain as seed and gene material in times of need. These banks could be managed by the *Palli Samitis*, and the Panchayats, with support from technical institutions.

These participants will be assigned the task of discussions with the community leaders/ villagers and village level institutions. This will result in developing an action plan for the establishment of the **gene-seed-grain banks** their locality and also develop a strategy for its implementation in terms of physical and technical resource that it may require.

2.2.4 Linking Cultural Diversity with Biodiversity

The United Nations Millennium Declaration (2000) called for "Respect for Nature" as one of the fundamental values for humanity. The Declaration urges: "Prudence must be shown in the management of all living species and natural resources, in accordance with the precepts of sustainable development. Only in this way can the immeasurable riches provided to us by nature be preserved and passed on to our descendants. The current unsustainable patterns of production and consumption must be changed in the interest of our future welfare and that of our descendants." The Declaration calls for a new ethic of conservation and environmental stewardship.

Respect for biological diversity implies respect for human diversity. Both elements are fundamental to stability and durable peace on earth. The key to creating forms of development that is sustainable and in harmony with the needs and aspirations of each culture implies to abandon patterns that undermine the lives and perspectives of those cultures. Tolerance and reciprocal respect for cultural distinctiveness are indispensable conditions for increased mutual understanding among the world's peoples and recognition of our common humanity.

The interaction between biodiversity, human languages and cultures may be best observed at the local level. Here, landscapes are not only shaped and modified by human activity but also symbolically brought into the sphere of human communication, by words, stories, songs, proverbs and legends that encode and carry human relationships with the environment.

Not only biological species, but also many ethnic groups around the world are now faced with extinction. The causes and consequences of this loss lie in the increasingly unsustainable exploitation of the Earth's natural resources and the growing marginalization and dispossession of indigenous and minority groups.

The more we lose diversity, both culturally and in the natural world, the more we run the risk of instability. We will become incapable of dealing with natural disasters such as crop failures and droughts. Local, traditional and indigenous knowledge and their custodians have therefore to be protected. It is time to give an economic value to this knowledge and to the genetic resources so carefully nurtured by indigenous peoples, just as we protect intellectual property rights. A sustainable society can only be achieved through the participation and empowerment of all peoples.

The participants of the course will be assigned specific task of identifying the linkage between biodiversity and cultural diversity with reference to specific plant and animal resources based on the ritual, cultural and spiritual dimension. For example, a particular tree is associated with the place of worship as well as the conservation practices being followed in sacred grooves. This will be in form of a documentation based on discussion with the communities.

2.2.5 Creating an Economic Stake in Conservation: Reward and Recognition

India enacted the Protection of Plant Variety and Farmers' Rights (PPVFR) Act in 2001 in accordance with its commitment under the Trade Related aspects of Intellectual Property rights (TRIPS) of the World Trade Organization (WTO). The Government of India notified the Rules on this Act in 2003. The Protection of Plant Variety and Farmers' Rights Authority (hereafter referred as the Authority) was constituted on 11 November 2005 along with bringing in force certain provisions of the Act; vide Govt of India Gazette Notification. During the last one year the Authority developed and finalized DUS (Distinctness, Uniformity & Stability) test protocols for 12 cereal and pulse species, namely Wheat, Rice, Maize, Lentil, Urad bean, Mung bean, Rajma, Chickpea, Field pea, Pearl millet, Sorghum, and Pigeon pea. It is also in the process of finalizing similar test protocol for another 13 oilseeds, fiber, sugar and forage crop species, namely Rapeseed mustard, Groundnut, Soybean, Sunflower, Safflower, Castor, Sesame, Linseed, Cotton, Jute, Sugarcane, Lucerne, and Barseem. Out of these 25 species, registration process on the first mentioned 12 cereal and pulses species was launched on the 20th February 2007. Gazette notification of this registration process is expected very soon for formalization of this process.

Two of the important objectives of the PPVFR Act are; (1) to provide an effective system protection of plant varieties and the rights of farmers and plant breeders, and (2) to recognize and protect rights of the farmers in respect of their contribution made at any time in conserving, improving and making available plant genetic resources for the development of new plant varieties. This Act in a separate Chapter of Farmers' Rights allows farmers to register their varieties as extant varieties; to be eligible for recognition and reward from the National Gene Fund; to enjoy the traditional right on the seeds-for saving, sowing, re-sowing, exchanging, sharing and selling; to be eligible for compensation in lieu of an agronomic

performance inferior to what is claimed by the breeder of a variety, etc. Apart from farmer rights provided in the Act, it also mandates the Authority to establish and maintain a National Register of Plant Varieties of all crops which are brought under this Act (Sec.13) and documentation, indexing and cataloguing of farmers' varieties (Sec 8 (2) c). Such documentation, indexing and cataloguing are to be carried out in a manner, which would assist the authority in identifying novelty of a given new plant variety in any future registration application. This necessitates documentation of farmers' varieties for DUS characteristics along with data on their geographic origin and the farmers or farming community responsible for the origin and conservation of such varieties.

According to the Rule 24 of the Act, application for the registration of all extant varieties of a given crop species have to be filed within three years from the date of notification on the opening of registration of varieties of such species. For instance, having the registration of varieties of the above said 12 grain species been launched very recently and the Gazette publication on the same is expected very soon, the time for registration of the extent varieties of these species started ticking down. While the Indian Council of Agricultural Research has taken initiatives in DUS characterizing almost all ICAR bred and released varieties of the said 12 species, no effort is initiated so far on characterizing the farmers' varieties of these species. Although there are thousands of farmers' varieties in most of these 12 species and characterization of all of them would be a Herculean task, it is important that all farmers' varieties known for important specific traits are characterized and such characterization data brought into the National Register of Plant Varieties (NPVR). It is also possible that such characterization farmers' varieties may facilitate registration of a few important varieties, which are widely grown in certain pockets and having larger seed demand.

The Convention on Biological Diversity calls for benefit sharing with indigenous people holding such traditional knowledge. The Tropical Botanical Garden implemented this and Research Institute (TBGRI) in Thiruvananthapuram in Kerala in case of a tonic called jeevani that they developed based upon information derived from members of Kani tribe about properties of a forest herb, *Trichopus zeylanicus*. Aryavaidyashala, a pharmaceutical company, paid a royalty of Rs 10 lakh for this product to TBGRI. In turn, TBGRI shared 50% of this amount with a Trust established for the benefit of Kani community. Since these transactions occurred before the passage of India's Biological Diversity Act, they had no legal backing and have run into difficulties. Yet, they represent a pioneering attempt at benefit sharing with respect to community knowledge. Proper recording of such knowledge through the medium of PBRs, coupled to implementation of benefit sharing provisions of the Act by the National Biodiversity Authority could in future bring benefits from community or individual, oral knowledge of such use to the people at the grassroots.

Therefore, DUS characterization of farmers' varieties is an important primary requirement for the protection of farmers' rights associated with the Indian agrobiodiversity. Today the capability for DUS characterization of farmers' varieties is available only with the public research institutions and a few non-governmental institutions, which are having technical strength on this area.

For the purpose of ensuring varietal registration and also enabling the communities to get reward and recognition for the contribution for conservation of genetic resources, it would be useful to get the following information from the community.

This will empower the community in enabling them to understand intricacies of the process in getting recognized for recognition and reward systems.

- Name of the Applicant (s):
- Postal address:
- Which Agro biodiversity hot spot the applicant belongs.
- Crop in which conservation efforts made:
- Practices developed, if any that promotes agro biodiversity
- Area and locality of conservation.
- Name of the area where germplasm and farmers' conservation effort is dense and significant
- Details of the material that were freely shared with Varietal Breeding Programme
- Based on the genetic resources, whether new variety developed deriving useful traits from the conserved and shared germplasm and with whom?
- How many varieties stemmed out of such effort and by which agency?
- What is that distinct trait that proved useful?
- How much area it occupied when it was popular?
- How many years that variety was in cultivation?
- Was that new variety notified under the seed Act, 1966?
- If so give breeder/foundation/certified seed production details which is verifiable by farmers' record:
- Was that variety released for cultivation in the area/zone from where the genetic diversity was supplied?
- Name of the organization that identified that useful resource and developed the variety.
- Whether the farming community already rewarded or recognized for this conservation effort for variety development?

***Information required for Inventory, Characterization and
Documentation of Farmers Varieties***

General

Vernacular name:

Whether the name reflects association to: region/trait/community, etc.

Area of occurrence: Association to region/province/districts/block/village etc.

Developing community: Associated ethnic group/community/farmer etc.

Area of adaptation:

Physical : Distribution/spread/acreage

Biological : Eco-geographical region/agro-ecosystem/production systems

Developmental History

Who identified it first (farmers or community name)

Parentage (Selection)

Period of cultivation (in years)

Seed System under use

Formal

Informal

a) Self-perpetuating (methods of storage/conservation)
b) Exchange (farmer to farmer; between communities)
c) Market (local, grain mundies)
Characteristics
<i>Agronomic</i>
Soil type (Alfisol/vertisol etc.)
pH etc. (Alkaline/acidic etc)
<i>Biological</i>
Reaction to prevailing diseases, pests and abiotic stress
Unique/distinctive features of the conserved germplasm/or farming technology
Source of information

Check Your Progress 1

Note: a) Use the space given below for your answer
b) Compare your answers with those given at the end of the unit

1. Explain about Peoples Biodiversity Register.
.....
.....
.....
2. What are the functions of Community Gene-seed-grain bank?
.....
.....
.....

2.3 LET US SUM UP

- A resource management participant enables to gather on the spot information on the issues related to conservation, diversity of resources and also the present and perceived threat to the sustenance of the system. This information would also have given the lacunae and gaps in existing traditional knowledge system as well as the policy regimes under which the system operates. This study will also bring out the opportunities as perceived by the communities for ensuring sustainable management of the system.
- Based on the collected information, the participants will finally develop an actionable work plan for the locality taking into consideration the sustainable management of the systems based on the present strength as well as the perceived threats to the system. The action plan should follow the following steps and a detailed documentation will be brought out by the participants and finalized based on discussions with community representatives who participated in the study.
- The basic characteristics of a participant are developing a rapport with the community and user groups, undertaking structured group discussions with the group, participatory mapping of the landscape of the study area etc.
- Simultaneous compilation of scientific/technical information available on focal issues and habitats and focal species to feed into plans of management and value addition is very important.
- Developing a cadre of resource managers must be the basic output of a long term natural resource management strategy.

2.4 KEY WORDS

Natural Resource Management: Proper utilization of natural resources.

Peoples Biodiversity Register: Platform for the community members to list the resources around them.

Cultural Diversity: The diverse forms of age old human culture.

Village Seed Banks: Collection of seeds at village level managed by the community for future use.

2.5 REFERENCES AND SUGGESTED FURTHER READINGS

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 - International Union for Conservation of Nature (www.iucn.org)
 - National Biodiversity Authority (www.nbaindia.org)
 - Plant Variety Protection and Farmers Rights Authority (www.plantauthority.gov.in)
 - Food and Agriculture Organization (www.fao.org)
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2.6 KEY TO CHECK YOUR PROGRESS

Check Your Progress

1. Your answer must include the following points
 - how it forms biodiversity committee
 - BDC functions at various levels.
 - prudent applications of PBR.
2. Your answer must include the following points
 - Contributions to local and indigenous communities,
 - processing of farmers rights in to practices
 - how they will develop rapport with rural community through PRA
 - what are the main differences between gene, grain, seed banks.